

# FLIGHT

*The*  
**AIRCRAFT  
ENGINEER  
&  
AIRSHIPS**

First Aeronautical Weekly in the World. Founded January, 1909

Founder and Editor : STANLEY SPOONER

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## Flight

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### "FLIGHT" PHOTOGRAPHS

To those desirous of obtaining copies of "Flight" Photographs, these can be supplied, enlarged or otherwise upon application to Photo. Department, 36, Great Queen Street, W.C.2.

### DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list—

1928

Nov. 22.... Lecture, "Weight of Aircraft," by Maj. T. M. Barlow, before R.Ae.S.

Nov. 29.... Lecture, "Production Problems," by F. Sigrist, before R.Ae.S.

Dec. 3-8.... International Aeronautical Exhibition, Chicago, Ill.

Dec. 6.... Lecture, "Control of Aeroplanes by Alulas," by Capt. A. P. Thurston, before R.Ae.S.

Dec. 12-14 International Conference on Aviation, Washington, U.S.A.

1929

May 21.... Northampton Air Pageant

July 16-27 7th International Aero Exhibition, Olympia

Oct. 31.... Guggenheim Safe-Aircraft Competition Closes

## EDITORIAL COMMENT



IN the whole history of British aviation it is doubtful whether a task of such magnitude, and at the same time so exacting in its demands, has ever been successfully accomplished by an aircraft firm as that which is now almost completed at the Norwich works of Boulton and Paul, Limited. This task, the full details of which were revealed for the first time on Tuesday of this week, when representatives of the technical press were permitted to inspect the work, consisted in designing and producing the whole of the structural work for the new 5 million cub. ft. airship R.101, which is being erected at the Royal Airship Works at Cardington.

In order to avoid being misunderstood when we say "designing and producing" the structural framework, the system followed in dividing the design responsibilities should be made quite clear. Single-line diagrams (diagrams in which each girder or member was represented by a line) were stressed by the Royal Airship Works, and the geometry and loads thus available were used by Boulton and Paul to convert this line diagram into an actual structure. In other words, Cardington said, in effect: "Here is a member of such and such a length, having such and such a curvature, and to be capable of sustaining such and such a load," and Boulton and Paul then designed the actual built-up girder structure to fulfil the stipulated conditions. It will be realised that the very closest collaboration between the two design staffs was essential, and Mr. J. D. North, Boulton & Paul's chief engineer, was appointed to act as consultant to the Director of Airship Development.

The airship was so designed, as a compromise between perfect aerodynamic shape and practical manufacturing possibilities, that its main longitudinal girders were arcs of circles, varying between one degree and two degrees of arc, and having radii in the neighbourhood of a quarter of a mile. When these arcs are joined together, they actually form a series of different curves which, although not theoretically perfect, approach so closely to the streamline form

that the difference in drag would probably be negligible. At the same time, the use of arcs of circles enabled the calculations to be carried out with a reasonable and practicable amount of work, although even so the task was very great, and it proved necessary in the calculation of the detailed geometry to work to fifteen significant figures! On the face of it, this sounds perfectly absurd, but it should be remembered that these figures were the result of *differences* and that the cumulative effect of many sections having to be added together to form a hull many hundred feet long might have caused a great deal of trouble unless the work was carried out to very close limits indeed.

It would have been forgivable if the firm had been daunted by such demands, but Boulton & Paul's went into the matter, convinced themselves that it could be done, and undertook the work. The results appear to have justified their confidence, and we are informed that although the majority of the work has been completed, there has not been a single rejection due to the geometry and dimensional accuracy having been at fault. That, we submit, is an eloquent testimony to the order of accuracy that is practically obtainable when a firm really sets out to see what it *can* do.

It may not be realised that there are very fundamental differences between the R.101 form of construction and that of the Zeppelin airships built so far. Whereas the Zeppelin airships have been largely built "in place," *i.e.*, the members brought together in their final relationship and then riveted up, R.101 has been built in sections, the sections being completed at the Boulton & Paul works, sent to Cardington, and there erected simply by being bolted together. With the German system the actual manufacture may (we doubt if it is) be a little cheaper, but the erecting must be much more expensive, if, indeed one can refer to the process as practised at Friedrichshafen as erecting. Moreover, with the German system, the building of two or more airships of the same type does not result in as great a saving in cost as would the British system. Put in another way it may be said, although not, perhaps, with entire accuracy, the Zeppelin airships are individually built; the R.101 type of construction calls for great standardisation and the extensive use of jigs. Indeed, without such use of jigs the airship could not have been built with the form of construction employed.

The remarkable thing is that, in spite of the necessity for working to what has been almost absurdly close limits, the manufacture of the structure of R.101 has not proved anything like such an expensive

business as might have been expected. Jigs and special tools have naturally cost considerable sums, but much of this expense must have been retrieved in the resulting accuracy which enabled the erecting to be done in a very short space of time and by a very few workers, without any fitting having to be done.

Space and time do not permit of giving in this week's issue of FLIGHT details of the construction used in R.101; these must be reserved for a future occasion. But to give some idea of the accuracies to which the manufacturers had to work, it is of interest to mention here that on longitudinal girders 45 ft. in length, the tolerances permitted were only  $\pm 0.03$  in. In the socketed stranded cables, of the same length, the tolerances were  $+0.2$  and  $-0.0$  after stretching. That this degree of accuracy has, in actual fact, been not only attained but exceeded, is proved by the fact that the assembly in the airship in continuous lengths was carried out without a hitch. The assembly stage reached at present gives 15 continuous girders of approximately 500 ft. in length, and if the cumulative effect of inaccuracies were to have proved of any importance, it would have been reached by now. This has not been the case, and in this fact may be found the proof of the excellence of the work carried out by Boulton & Paul.

To us the real significance appears to lie in the proved possibility of working, on a very large scale, to such fine limits. Whether R.101 is a complete success or not, the construction of the structure has proved that a British aircraft firm is capable of undertaking work which, we confidently assert, could not have been excelled anywhere in the world. As a piece of structural engineering, and quite apart from its specific purpose, the R.101 girder work is little short of a revelation.

To give some idea of the magnitude of the task of building the structure of R.101, it may be stated that the longitudinal girders total a length of two miles and comprise 6 miles of booms, 18,000 side and base struts (which absorb 8 miles of tubing), 26,952 tie rods totalling 15 miles in length. The ridge girders add another two miles, and comprise 6 miles of booms, 12 miles of webs and 450,000 rivets. The main and intermediate radial struts total  $3\frac{1}{2}$  miles of booms,  $3\frac{1}{2}$  miles of webs,  $1\frac{1}{2}$  miles of tubing and 150,000 rivets. The tubing in fins and rudders total 1.8 miles. The tubing of all types in the airship total no less than 27 miles. Of bolts and nuts there are 65,000 in the structure, while the bracing cables used amount to a bagatelle of 11 miles.

is stated to include also the erection of hangars and the preparation of landing fields. Some five to six hundred men are to be employed by the company.

#### Sir John Salmond and Canada

At Montreal, Canada, where he arrived on November 16, in the course of his return from Australia to England, Sir John Salmond said that he was impressed with the work of the patrols carried out in Canada.

#### The M.V. Isacco Design

THE Isacco machine now under construction at Messrs. Saunders, Isle of Wight, for the Air Ministry, will, it is suggested, combine helicopter with autogiro virtues in its design. It is expected to rise and descend vertically. In appearance it will be like an autogiro mounted above an ordinary fuselage, but each of the two windmill blades will carry a small engine driving an airscrew. These revolve the blades.

#### T. O. M. Sopwith Flies Again

LAST week—on November 14, if we are not mistaken—Mr. T. O. M. Sopwith, one of our pioneer pilots, once more flew an aeroplane after an interval of several years. In this flight, from Brooklands to Martlesham in a new Hawker machine, Mr. Sopwith showed that he had lost none of his previous skill, and his take-off and landing called for little, if any, criticism. Except for occasional flights during the war, this was his first "solo" since the good old days at Brooklands-cum-box-kites. Flight-Lieut. P. W. S. Bulman was Mr. Sopwith's passenger on this little trip to Martlesham.

#### Another Large Aeroplane Factory in Canada

THE Fairchild Aviation Company of Canada has decided to erect a new \$500,000 plant at Grand'Mere, Que., for the manufacture of aeroplanes. Operations are to be begun early in 1929, and production will probably be at the rate of five or six machines weekly. The company's programme

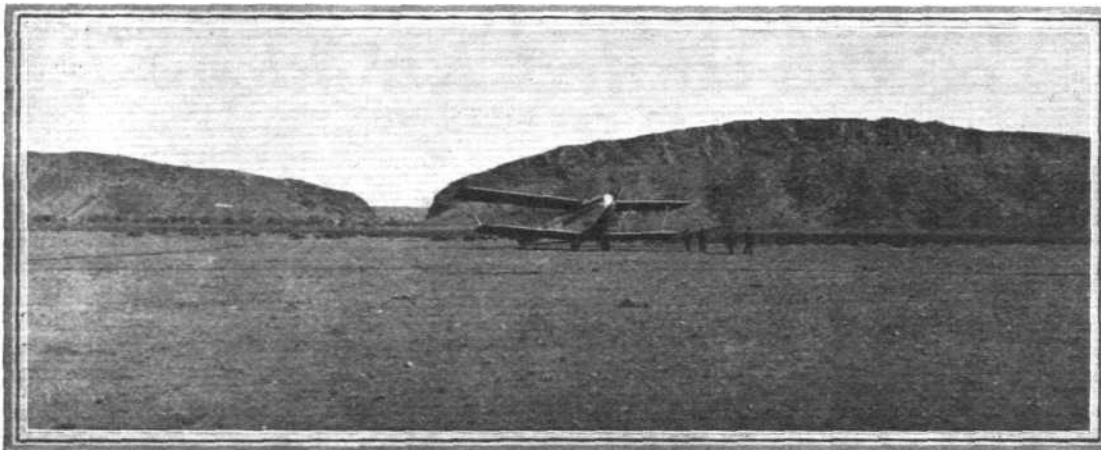


## AIR TOURS TO CENTRAL AUSTRALIA

THE Larkin Aircraft Supply Co., Ltd., of Melbourne, Australia, of which Mr. W. S. Shackleton, the former designer of Messrs. William Beardmore, Ltd., is now designer, has been engaged on pioneer flights into Central Australia in recent months. These flights were made in conjunction with an advertising scheme of Victorian Railways to induce Australians and tourists from abroad to visit Palm Valley in Central Australia. This spot is considered one of the most wonderful beauty places in the world. It is a small district covered with tropical vegetation and palms, with water holes for fishing and streams and rocks abounding. It is situated amidst thousands of miles of country uninhabited except for a few wandering blacks. The nearest railway station is at Oodnadatta, 350 miles away, and only a few white men have ever explored this oasis. Oodnadatta marks the end of the present railway line from Adelaide, but it is proposed to extend the line to join that which runs from Darwin to Catherine.

ever since the country has been taken up. The wild tribes occasionally pay the local mission a visit. Sometimes they see nothing of them for a full 18 months. So air tourists may rest assured that they have nothing to fear from wild natives when camped in Palm Valley. The climate is great in winter; water is plentiful and scenery grand! To think, says Mr. H. S. Heinrich, a missionary, that in the near future there is a prospect of aerial communication being established between Palm Valley and Adelaide or the outer world, makes him think how, in the olden times, when he first went up, it took nearly three weeks to do the journey which will take now perhaps little more than one day.

The Larkin Company made two expeditions, first with ANEC III machines piloted by Capt. Frank Neale, one of their air line pilots, who operates the legs of their Melbourne-Hay line. He reached Alice Springs. Incidentally, Shell petrol supplies were laid by camel team from Oodnadatta to Alice



✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻  
✻  
The Larkin ex- ✻  
pedition's ANEC ✻  
III landing ✻  
near McDonnell ✻  
Ranges at Alice ✻  
Springs, Central ✻  
Australia. The ✻  
pilot was Capt. ✻  
F. Neale. ✻  
✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻

Aerial transport is inevitable for this project, because Palm Valley, which is on the River Finke, cannot be approached by motor, for there is no track. Mission authorities constructed one about four years ago, but a flood destroyed it, and this devastation would occur again and again, meaning an outlay of £20 to £30 for repairs each time. There could be an alternative route to Palm Valley to that along the river but that again presents difficulties, financially and as regards labour. It would be beyond the skill of the aboriginals, although not an impossible engineering feat.

The local missionaries have pointed out that air transport would be the best medium in the circumstances. There are several flat areas in the valley which could easily be made suitable for landings. There are no real wild blacks within 150-200 miles. They are only found on the Petermann and Musgrave Ranges to the south-west, the other side of Lake Amadeus and to the northwest at Picilli Springs and west of the Lander. All the roving bands nearer are more or less civilised fellows who have come in contact with the whites

Springs for the expeditions. At that place young blacks had high jinks with the expedition's tyres.

The biggest expedition was led by Capt. H. J. Larkin, D.S.O., D.F.C., the managing director, who piloted a D.H. 50. With him went Capt. F. Neale, flying the ANEC six-seater. Each machine covered well over 3,000 miles and only one small mechanical trouble was experienced. That was a water leak in one of the Rolls' cylinders.

A start was made from Melbourne on July 4, and the first course was set for Mildura, a large town on the Murray River, near the border of New South Wales, a distance of over 300 miles. Lunch was taken there. The next stage was over country to Broken Hill, New South Wales, 170 miles, a mining centre to the west of the State. The night was spent there. Up to that stage the route followed had been over the organised mail route operated by Australian Aerial Services, Ltd.

For the next section, from Broken Hill to Wertaloona Station, uncharted and sparsely populated country was



FLYING IN CENTRAL AUSTRALIA: The D.H.50 (right) and ANEC III passenger machines at Hermannsburg, Central Australia, after flying 1,300 miles from Melbourne. The pilots were Capt. H. J. Larkin and Capt. F. Neale.

crossed. Lunch was taken at Wertaloona Station, and the flight continued in the afternoon to Farina Town, a fairly large town on the Adelaide-Darwin railway line near Lake Torrens, in the State of South Australia. The total stage, Broken Hill—Farina Town, was 280 miles.

Four days were spent there and local places of interest were visited by members of the expedition. It was there that the first signs of outpost life were seen. Camel and donkey teams were seen as mediums of transport. Aborigines were observed. Oodnadatta, South Australia, a distance of 225 miles, was next reached after a flight round the north and south Lakes Eyre. The following morning, Hermannsburg was the destination. On the way, a stop for fuel was made at Charlotte Waters, in Northern Territory, a distance of 110 miles. Hermannsburg was another 190 miles and there the Mission Station authorities had prepared an aerodrome for

the arrival of the first aircraft to that part of Central Australia. For six days the expedition stayed at Hermannsburg as the objective for visits by camel to Palm Valley at the rate of 3 miles per hour.

An encampment in that oasis of great scenic beauty situated several miles from the Mission Station was made beside a clear rock pool. Although the tour was made in mid-winter the days were warm and the atmosphere was found to be conducive to rest. It was, altogether, an ideal holiday resort.

The return flight to Melbourne, a distance of 1,300 miles, was made in four days, flying only in the mornings and leaving the afternoons for sight-seeing.

The expedition was greatly impressed with the possibilities of the scheme to Palm Valley. If a small development subsidy is granted by the Federal Government, arrangements will go ahead for a winter encampment in 1929.

## The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

REPORT of Meeting of the Committee of the Royal Aero Club held on November 14, 1928:—

**Present**—Brig.-Gen. Lord Thomson, P.C., C.B.E., D.S.O., in the Chair; Griffith Brewer; Capt. R. J. Goodman Crouch; Lieut.-Col. M. O. Darby, O.B.E.; Lieut.-Col. J. D. Dunville, C.B.E.; Colonel F. Lindsay Lloyd, C.M.G., C.B.E.; Lieut.-Col. Sir Francis K. McClean, A.F.C.; Lieut.-Col. M. O'Gorman, C.B.; F. Handley Page, C.B.E.; Major H. A. Petre, D.S.O., M.C.; Capt. C. B. Wilson, M.C.; H. E. Perrin, Secretary.

**Election of Members.**—The following new members were elected:—

Maurice William Baseden.  
Flight-Lieut. Arthur Harold Beach.  
Malcolm Campbell.  
Wing-Com. Arnold Richard Charles Cooper.  
Alfred Wilhelm Gaedertz.  
Reginald Benson-Godfrey.  
Samuel Thomas Lea.  
R. S. Mackenzie.  
Graham Mackinnon.  
Lieut. Edward Victor Somerset.  
Edward Freer Stephen.  
Victor Charles Terry.  
Charles Edgar Winter.

**Aviators' Certificates.**—The following Aviators' Certificates were granted:—

8435 Herbert Fortington Neave, Norfolk and Norwich A. C.  
8436 Graham Mackinnon, Cinque Ports Flying Club.  
8437 Alan Moulds, Liverpool and District A.C.  
8438 Dorothy Brewster Fletcher, London A.C.  
8439 Robert Balderston Whyte, Scottish Flying Club.  
8440 Alexander Christie Jack, Scottish Flying Club.  
8441 Christopher Ransom, Norfolk and Norwich A.C.  
8442 John Faulkner, Lancashire A.C.  
8443 Dennis Royle Farquharson Campbell, Hampshire A.C.  
8444 Barker Whittle, Hampshire A.C.  
8445 Walter Evershed, Hampshire A.C.  
8446 Frederick James Steward, Midland A.C.  
8447 Graham Andrew Little, Yorkshire A.C.

8448 Roland Cecil Winn, Nottingham A.C.  
8449 Ram Nath Chawla, Nottingham A.C.  
8450 Walter Scott Coates, Norfolk and Norwich A.C.  
8451 Benjamin Ludlow Bathurst, Bristol and Wessex A.C.  
8452 Thomas William Shipside, Nottingham A.C.  
8453 Thomas George Masters, Surrey Flyg. Services.  
8454 Quenelda Anne Naylor, Liverpool and District A.C.  
8455 Arthur Lionel Finch Hill, London A.C.  
8456 Mostafa Riad Moursi, Surrey Flyg. Services.  
8457 Lewis Wigham Hall, Nottingham A.C.  
8458 Dinkar Sadasheorao Pandit, De Havilland Flyg. School.  
8459 Lionel William Lowen, Norfolk and Norwich A.C.

**British Speed Record.**—The following British Speed Record was granted:—

Aircraft: Supermarine Napier S.5.  
Engine: 500/900 h.p. Napier "Lion."  
Pilot: Flight-Lieut. D. D'Arcy A. Greig, D.F.C., A.F.C.  
Date: November 4, 1928.  
Place: Southampton Water.

**Performance.**—Greatest speed over straight line course of 3 km.:—318.62 miles per hour = 512.776 kms. per hour.

**F.A.I. Conference, Paris.**—Lieut.-Col. M. O'Gorman reported on the Conference of the F.A.I. held in Paris on October 22-24, 1928, at which he represented the Royal Aero Club. The following items were included in the report.

(1) Revised status of the F.A.I.; (2) Introduction of automatic timing for high speed records; (3) Introduction of temperature compensated barographs for records; (4) Customs Carnets. The additional countries in which the customs carnet will shortly be available; (5) International competition for touring aircraft; (6) Revision of categories for light aeroplane records.

**High Speed Records.**—The committee discussed generally the regulations governing high speed records with a view to making recommendations to the F.A.I. for certain alterations.

Offices: THE ROYAL AERO CLUB,  
3, CLIFFORD STREET, LONDON, W.1.  
H. E. PERRIN, Secretary.

### International Conference on Civil Aviation

THE International Conference on Civil Aviation will be held in Washington on December 12, 13 and 14 next, and the Royal Aero Club will be represented by Brig.-General Lord Thomson, Chairman of the Club, and Captain R. J. Goodman Crouch.

### The Next Northampton Air Pageant

So successful was the Air Pageant held by the Northampton Aero Club on September 29 last, it has been decided to hold another one on Whit Tuesday, May 21, 1929. All pilots, aircraft manufacturing firms and members of various clubs are cordially invited to attend. Further details of the arrangements will be announced in due course, but anyone desiring information regarding the Club or the Pageant should apply to the Joint Hon. Sec., P. Hayward, 19, Market Square, Northampton.

### The Royal Air Force Memorial Fund

THE usual meeting of the Grants Sub-Committee of the Fund was held at Iddesleigh House on November 1. Mr. W. S. Field was in the chair, and the other members of the Committee present were:—Mrs. L. M. K. Pratt-Barlow, O.B.E., Sqdn.-Ldr. Douglas Iron, O.B.E. The Committee considered in all 17 cases, and made grants to the amount of £200 10s.

The usual meeting of the Grants Sub-Committee of the Fund was held at Iddesleigh House, on November 15. Lieut.-Commander H. E. Perrin was in the chair, and the other Members of the Committee present were:—Mrs. L. M. K. Pratt-Barlow, O.B.E.; Mr. W. S. Field; Squadron-Leader Douglas Iron, O.B.E. The Committee considered in all 14 cases, and made grants to the amount of £114 3s. 8d.

The next meeting was fixed for November 29, at 2.30 p.m.



## THE BRITISH AERO EXHIBITION, JULY, 1929

At the Savoy luncheon on November 15, Sir Samuel Hoare, the Minister for Air, gave the first official announcement of the International Aero Exhibition which is to be held in July next year under the joint auspices of the Society of British Aircraft Constructors, Ltd., and the Society of Motor Manufacturers and Traders, Ltd. The Chair was occupied by Capt. P. D. Acland, Chairman of the S.B.A.C., who submitted the toast of the Secretary of State for Air and the Air Council. Speaking of the Secretary of State for Air, Capt. Acland said that they well knew what he had done to advance aeronautics, but there was a small point he wished to draw attention to, namely, that the Air Council, at their request, a short time ago, went so far as to alter their training programme in order that the Royal Air Force Display should take place on a date close to the Exhibition they proposed to hold next year. He thought that an industry which had such an active and practical form of collaboration from its best and most cherished customer was, indeed, fortunate, and it was a pleasure to give public testimony to the kindly act of the Secretary of State for Air, the Chief of the Air Staff, and the remaining members of the Air Council.

In his response, Sir Samuel Hoare, expressing the gratitude of the Air Council to Capt. Acland and his friends, also remarked that fortunately, with the Air Ministry and aviation, unlike some public departments, there seemed to be no party politics at all, and it was significant that there the Chairman had on his right a Conservative Secretary of State, and on his left a distinguished gentleman who, a short time ago, was a Labour Secretary of State.

Continuing, Sir Samuel said that he was glad to say a word in support of what he believed to be a most excellent and important project. We had got a habit of disparaging ourselves and appearing to under-rate British effort. That was very well sometimes as a sign of national humility, but he got a little tired when certain people, not only in the field of aviation, but elsewhere, said that everybody seemed to be doing things much better than we were. He looked to the Exhibition to set that state of affairs right. The Exhibition would show the definite progress made since 1920, both in military aviation and civil aviation.

Sir Samuel Hoare then referred to Flight-Lieut. D'Arcy Greig's record and the recent successful seventeen thousand-mile cruise of his colleague, the Under-Secretary for Air, Sir Philip Sassoon. That was a feat, he said, which a few years ago would have been recorded as almost miraculous, but so great had been the progress during the last few years that we took a flight of that kind almost as a matter of course. He could also call attention to the series of long-distance flights by the Air Force during the last three or four years, which we took now as a matter of ordinary training routine, but we forgot that there was no other country in the world that had made flights like those, flights carried out in formation over thousands of miles of practically unsurveyed country. He also felt justified in saying that in metal production we were quite definitely ahead. The flight now taking place of the four metal Supermarine "Southampton" flying-boats to the Far East, was going to add valuable knowledge to that already possessed of metal construction. He ventured to give those illustrations to show that we had got something to show the public when the Exhibition took place next year. That Exhibition also had the full support of the Government and of the Air Ministry and, he was glad to say, it would be self-supporting, and not receive a Government subsidy. It was to be the first big international aviation exhibition that had stood on its own feet and had not been subsidised.

Referring to the rearrangement of the Air Force Display, Sir Samuel Hoare said that it might seem to those who did not understand the difficulties of Air Force training that it was not a difficult arrangement to make. As a matter of fact, it had been difficult, but he was glad to say that Sir Hugh Trenchard and his colleagues, with the desire of doing everything they could to help, had re-arranged the training programme, with the result that the Air Force Display would take place on the Saturday and the Exhibition would be opened on the following Tuesday. Moreover they were also going to show their sympathy with the enterprise by providing as fine an exhibit as they could from the Air Ministry.

In conclusion, Sir Samuel Hoare wished the Exhibition all success and repeated that they specially wished to give it all the support they could. He further expressed the hope that

not only would the Exhibition mark a stage in the development of British aviation, but mean the beginning of the new period during which we should see greater development than since the last Exhibition which was held nearly ten years ago, in 1920.

The Chairman, Capt. P. D. Acland, responding, said that they welcomed so much the very cordial collaboration and assistance which was being held out by His Majesty's Government. They found that during the last decade, since their last Exhibition, their whole energies had been expended on technical development, full-scale demonstration of material in flight, together with a number of exploits in collaboration with all sorts of outside interests. He did not think in an assembly of that nature that one should forget the services rendered to aviation by Sir Charles Wakefield, who had made possible a number of world flights designed to bring nearer the day when our Empire was welded together by means of the air. They had actually had an Exhibition under consideration for several years, but concluded that the time was not ripe until next year, owing to the fact that it was but recently that we had been able to get and achieve practical demonstrations of the seaplane and flying-boat. They felt proud that they had got arranged a full range of every form of aerial activity which they could show to the world in practical form. They had asked and hoped to get some representative exhibits from every aircraft and manufacturing country next year.

Furthermore it was the intention to design the Exhibition with a particular view of enlightening the public on the engineering problems which have had to be solved, the classes of aircraft engines and of many accessories and materials used in their production, the methods of manufacture, and the uses to which each apparatus could be put. With that end in view, the main portions of the Olympia would be occupied by complete aircraft, both for land and sea use, both civil and military, from the largest air liner and flying boat down to the light aeroplanes, which latter were rapidly becoming almost the ordinary and accepted means of communication. They heard that His Majesty's Government were having an exhibit. They hoped that their exhibit would pay particular attention, which he thought was important, to the general process which was gone through, with a view to obtaining security in the air and for the general supervision of manufacture, which was a most finished and wonderful organisation, which would be of the greatest interest to everybody. The aircraft from the raw material stages up to the time it was handed to a customer was under constant supervision, and after arriving in the hands of the customer it was still looked after, and they hoped they would show them that.

On the educational side and the historical side, the scientific body, the Royal Aeronautical Society, would organise a complete history of aeronautical progress from the beginning, and special arrangements were contemplated for the proper instruction and piloting of parties of school-children, students and interested parties round the show. To that they attached the very greatest importance. They had every reason to hope that foreign friends would support them. They were in active negotiations with various countries concerned, and had every reason to believe they would have most interesting things to show.

To sum up, the Exhibition would provide for the general public a comprehensive picture of the manner in which aircraft had become interwoven in national life, indeed, international life, for flight was essentially international in character, and it was only by such an exhibition that the great public, and in particular the commercial community, could be brought into direct touch with, and appreciate the practical use of that new means of locomotion, which was now definitely established. From the dawn of history man had desired to fly. The Exhibition would show how that desire had been translated into reality, and how aviation was becoming part of national life, even down to the stamp collector, whose interests would not be overlooked at the Exhibition.

Following Capt. P. D. Acland's speech, the toast of the Press was submitted by Mr. Handley Page, C.B.E., who also made a speech. The toast was responded to by Sir Roderick Jones. Lord Thomson then submitted the toast of the Chairman to which the Chairman responded.

### Air Transport by Railways

THE London and North Eastern, Great Western, the Southern, and the London, Midland and Scottish Railway

Companies are seeking powers in Parliament to provide and work aircraft for traffic of any description, and for this purpose to establish aerodromes, etc.

## SIR PHILIP SASSOON'S EASTERN TOUR

On September 29 last the Under-Secretary of State for Air, Sir Philip Sassoon, left Cattewater, Plymouth, on a tour of inspection of the R.A.F. stations in the Mediterranean, Egypt, Palestine, Trans-Jordan, Iraq, and India. On November 13 he returned to Plymouth, having flown 17,000 miles and spent 240 hours in the air. In that short time all the R.A.F. stations in the above-mentioned countries were inspected, which is truly a remarkable example of the powers of aircraft in rapid transport.

The greater part of the trip was carried out in a R.A.F. flying-boat, a Blackburn Iris, with three Rolls-Royce 700 h.p. Condors. The pilots of the Iris were Squad.-Ldr. C. L. Scott, D.S.C., and Flight-Lieut. L. Martin. The Under-Secretary was accompanied by Air Commodore A. M. Longmore, C.B., D.S.O., Director of Equipment, and altogether there were nine people on board.

Describing his tour, Sir Philip said that on the day of the start the weather was so bad that the Imperial Airways flying boat did not start for Guernsey. Nevertheless the Iris took off and flew along the course usually followed by flying-boats to the French air station at Hourtin, which Sir Philip described as an extremely charming place. Then, after refuelling, the Iris went overland to Marseilles. It followed the course of rivers, and Sir Philip said that it was comforting to see water below although he doubted if a large boat like the Iris, taking the air at about 14 tons, could have got down safely on the river.

Next day the Iris flew on past Corsica to Naples, where Sir Philip was met by his "opposite number," General Balbo, the Italian Under-Secretary for Air, and by the Marquis de Pinedo, Chief of the Italian Air Staff. The following morning the Iris made good time between Naples and Athens, so that Sir Philip was able to visit the Naples museums in the morning and the Athens museums in the afternoon. The route followed was down to the toe of Italy, and up the Gulf of Corinth.

On October 2 the Iris crossed the Mediterranean to Aboukir. The views of the Cyclades and Crete from the air were described by Sir Philip as delightful.

At Aboukir Sir Philip temporarily parted company with the Iris, embarked on a Fairey III F landplane, and reached Cairo by sunset. He spent two days at Cairo and inspected No. 4 F.T.S. at Abu Sueir, No. 208 Army Co-operation Squadron, and No. 216 Bombing Squadron at Heliopolis, and No. 45 Bombing Squadron at Helwan. Then, accompanied by Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., A.O.C. Middle East, he flew on to Khartum, with a stop at Wadi Halfa. Three Fairey III F machines made this flight, and they were met and escorted into Khartum by six other Fairey III F's from No. 47 Bombing Squadron.

After returning to Cairo, Sir Philip set out for Baghdad with a flight of three Wapitis with Jupiter engines, which were being delivered by air to No. 84 Bombing Squadron in Iraq, and inspected the R.A.F. units on the way. The first part of the flight across Palestine, and Transjordan was, said Sir Philip, very interesting, but the latter part across the Arabian desert was wearisome. In the hot weather the air off the desert was very bumpy, and though they climbed at times to 8,000 ft., and felt quite cold up there, it was difficult to escape the bumps altogether. Still he thought he was lucky, as the bumps were often worse than they were that day.

Sir Philip spent one day at Baghdad, and then left for Basra in a Victoria with twin Lion engines. The Iris had meanwhile made its way down the Euphrates to Basra, and he rejoined it there.

Flying down the Persian Gulf, the first mishap was met with at the very unattractive station of Jask, where engine trouble brought the Iris down. Still, being in a seaplane, Sir Philip had the advantage of some previous travellers, e.g., Sir Samuel Hoare and Sq.-Ldr. Hinkler, who were obliged to put up with the land side of Jask. Sir Philip was able to spend one night on a sloop, H.M.S. *Crocus*. The trouble proved to be a fracture of a camshaft ball race, and this was repaired by the crew, aided by the crew of the *Crocus*. The repairs, however, included the use of copper rivets in place of steel ones, so that after starting off the Iris had to return. Steel rivets were then improvised, and with them the Iris successfully made Karachi.

Next day Sir Philip flew in a Hinaiidi with two Jupiters to Jodhpur. After the dreary Scinde desert he found this Rajput City with its lake a delightful sight. There is a good aerodrome there, and H.H. the Maharaja entertained the party hospitably. Then they flew on to Delhi, and Sir Philip was much impressed by seeing from the air the lay-out of the new capital. Some of the Government buildings have been completed, but much yet remains to be done. Still the lay-out made an imposing sight. From Delhi Sir Philip went on in a D.H.9A to Ambala, and there he actually condescended to take a train on to Lahore and Simla. The latter city, of course, is 7,000 ft. up in the Himalayas, and though I seem to remember that an aeroplane once flew up and landed there, it is a feat not to be recommended.

After leaving the summer capital, Sir Philip flew in a Bristol Fighter along the Frontier from Peshawar to Quetta, visiting R.A.F. stations as he went. A forced landing among the Frontier hills must almost invariably mean disaster, but, fortunately, no such thing occurred on this occasion.

On October 24 Sir Philip started his return journey in the Iris from Karachi. Again, he was forced down at Jask by the same engine as before. An oil leak seemed to be responsible. Anyway, a new Condor was brought out from Karachi and installed, while a Hinaiidi was sent from Iraq to take Sir Philip over to Basra. This time he flew up to inspect the R.A.F. station at Mosul, which had been omitted on the outward journey. He joined the Iris again at Aboukir, and this time followed the African coast to Benghazi and across to Malta—the only other station not inspected on the outward flight. When the Iris started for Naples it was driven back by the foul weather connected with the Etna eruption. But it got through on the second attempt, and the party got a view of the volcano, still capped with snow, while the lava streams poured down and villages blazed in their paths. The same route as before was followed back to Plymouth.

Sir Philip said that the metal of the Iris stood up perfectly to the heat of the East. He found the boat very comfortable, and there was little vibration. He made rather long flights, but was not tired by them. "Time goes fast when you are flying," he said, "it makes you feel fit and well." He said that he saw a great future before the flying-boat.

F. A. DE V. R.

### Fairey Monoplane Tested

AT NORTHOLT recently the Fairey monoplane, which has been constructed to make an attempt upon the long-distance record, made its first test flight with every success. It is understood that the pilot was Sqdn.-Ldr. Jones-Williams, who has been chosen to pilot the machine on its ultimate long-distance flight.

### Empire World Air Routes

AN all-red route around the world is seen as a strong possibility in the near future by J. A. Wilson, the Canadian Controller of Civil Aviation, who recently returned from a sojourn of two months in the British Isles and Europe. "Enormous developments in inter-Empire communication may be expected within the next few years," Mr. Wilson said. "While efforts so far have been to some extent concentrated on flights to India and Africa, the eyes of British fliers are turning towards Canada."

### Aerial Photography in Canada

AERIAL photography for map-making purposes by Government fliers has been practically completed for the year according to Wing Commander J. L. Gordon, R.C.A.F. Eight detachments of two 'planes each have been operating

throughout the Dominion for several months. Three machines operating at St. Donat, Quebec, have already returned to Ottawa, while the remainder are expected within the next few weeks. Aerial surveys have been made throughout the Maritimes, in Northern Ontario, and as far north as Fort Smith in the North-west Territories. Preliminary maps of the various localities covered will be completed with data gathered this year.

### Fairchild-Caminez Activities

THE Fairchild Airplane Manufacturing Corporation of New York has purchased the minority stock interest of Mr. Harold Caminez and Mr. Leon Caminez in the Fairchild Caminez Engine Corporation. The activities of the Engine and Aeroplane Corporations will be consolidated, which gives the facilities of each company to the other and reduces overhead charges. Mr. Harold Caminez has resigned as Chief Engineer, and Mr. David Caminez has resigned as Treasurer of the Fairchild Caminez Engine Corporation. An 8-cylinder cam engine and a small 80-h.p. four-cylinder cam engine have been built and flown, but as yet experimentation has not progressed to a point where definite performance or specifications can be announced.



## THE BRISTOL "JUPITER" FAMILY—(III)

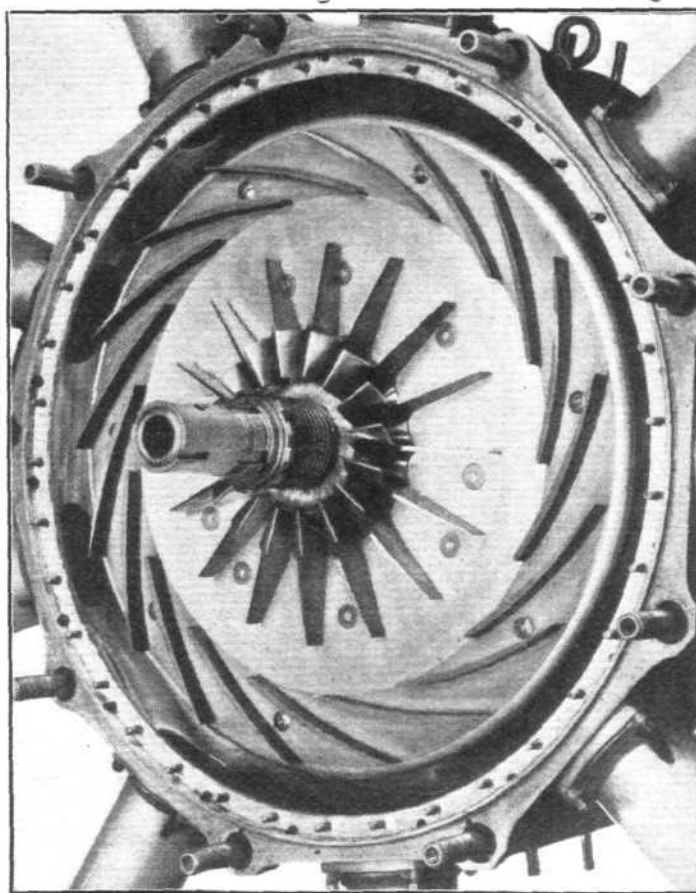
(Continued from page 987)

In our article last week we described the standard "Jupiter" induction system as fitted on the Series VI A, VI AM, and VI AL, and the geared types VIII, IX and XI, in which a three-start induction spiral is employed for distributing the charge to the cylinders. So far, there is but one type of "Jupiter" in which this system of distribution is not used. This is the type known as the Series VII, which is a special engine, in that it is supercharged by means of an engine-driven induction fan or blower. Unfortunately, it is not permissible to describe in detail the method of driving this blower, nor to give data relating to the speed at which the blower runs, the sort of pressures attained by its use, and other information which it would have been of great interest to publish. It must suffice to point out that the Series VII "Jupiter" develops full normal power at 12,000 ft., so that the amount of supercharging may, perhaps, be estimated from this by those clever enough to do so.

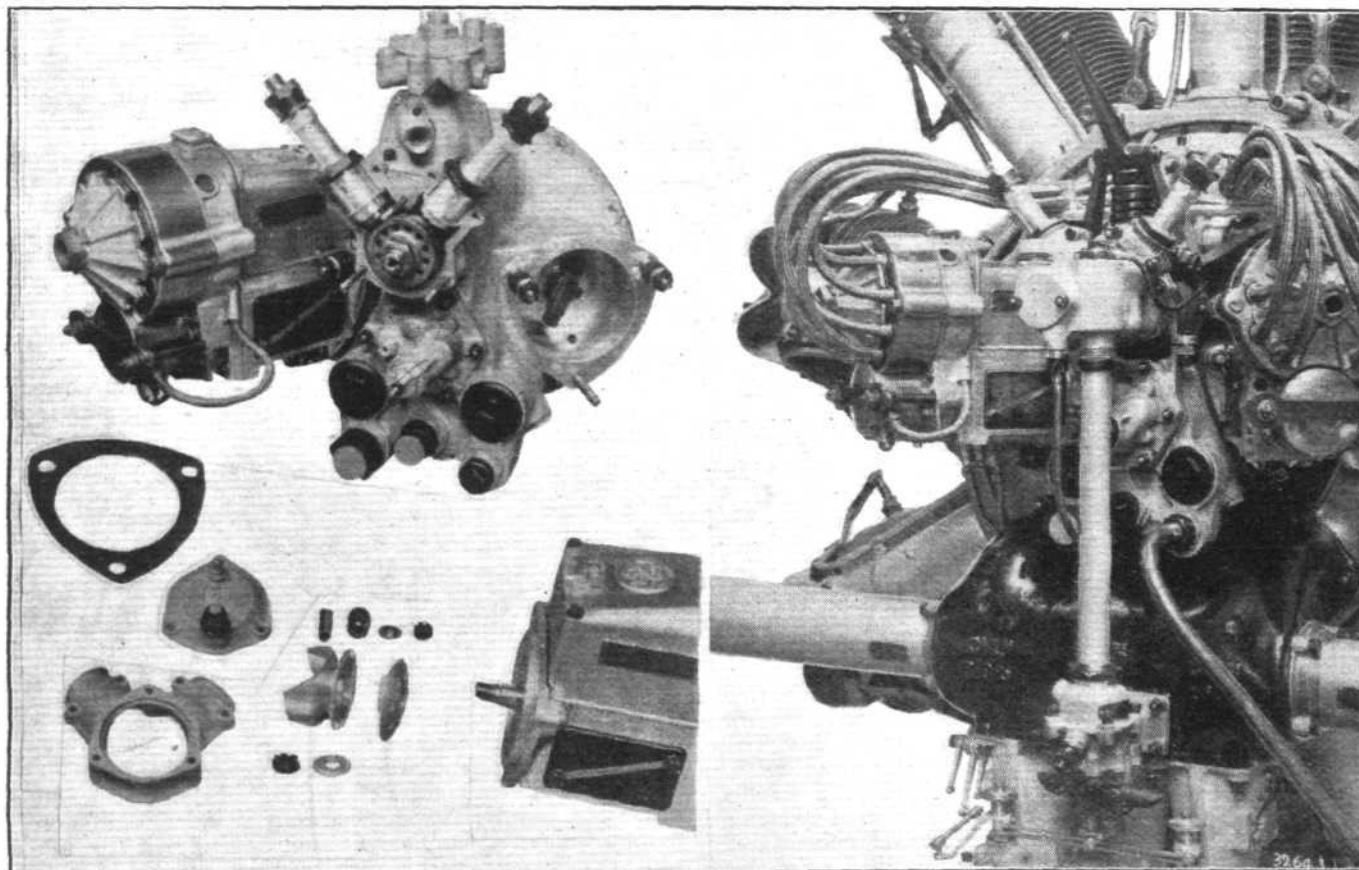
The blower used on the Bristol "Jupiter" VII is of the high-speed centrifugal type, and it embodies certain interesting patented features aimed at overcoming the inertia problems encountered with a mechanism of this type. A system of slipping clutches ensures that the impeller is protected from shock loads, and the torque in the blower drive is practically constant. One result of this, and of the low tooth loadings, is that the drive is exceptionally quiet and of good durability.

One of our photographs shows the Bristol blower, and from it it will be seen that the blower unit is mounted immediately behind the rear wall of the crank-case, in the annular chamber occupied by the spiral induction distributor in other "Jupiter" types. The Bristol "Triplex" carburettor is mounted on the intake side of the blower, and the mixture is drawn axially into the impeller and discharged radially or tangentially via a fixed diffuser into the annular induction chamber. From there the mixture is fed to the cylinders through the normal induction pipes.

Compared with the series VI "Jupiter," the supercharger enables the power to be maintained at 12,000 ft., where the series VI has dropped about 30 per cent. of its power. As



The gear-driven supercharger of the Series VII Bristol "Jupiter."

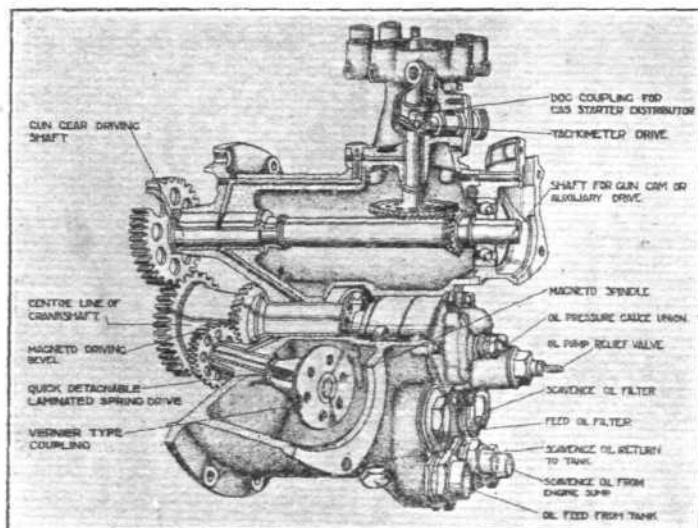


Rear view of geared "Jupiter," showing arrangement of engine-driven petrol pump, hand turning gear, gun gear generator, magneto mounting, etc.

the increase in weight due to the supercharger is but 5 per cent. or so, the Series VII engine amply justifies itself for aircraft designed to operate at considerable heights.

### Auxiliary Drives

From the earliest days of its history the "Jupiter" has had as one of its characteristic features the grouping of all auxiliary units at the rear of the engine. The majority of these units, such as magnetos, oil pumps and filters, gas starter distributor, tachometer drive, and gun-fire control gear, are mounted on the rear cover and removable from the engine with the cover as a complete unit. Being at the back of the engine, these auxiliary units are afforded a maximum of protection against damage and the effects of weather, while at the same time detachable panels in the engine cowling can easily be made to give access to all units that are likely to require attention in service. The front of the engine being



Part-sectioned view of auxiliary drives on Bristol "Jupiter."

left clear of accessories, a neat and clean front cowling can be used.

The engine back cover is attached to the crank-case by 10 bolts, the joint being made between the cover and the rear face of the annular induction chamber casing, just inside the circle of bolts securing the back cover for the induction spiral. Thus the whole unit can be removed by undoing these 10 nuts, except in the case of engines fitted with the Bristol gear-driven petrol pump. In these it is, of course, also necessary to disconnect the pump casing from the induction elbow.

The auxiliary drives may, for convenience, be divided into those co-axial with the crankshaft and those which are offset. Of the former, the magneto drive bevel is mounted on a sleeve surrounding the rear portion of the crankshaft, and being a sliding fit on it, so that as the back cover, in which the sleeve is mounted (in a white-metal bearing), is pushed home, the sleeve can slide over the tail end of the crankshaft. The magneto bevel driving sleeve is prevented from turning around the crankshaft by two keys formed on the inside of the sleeve, which engage with two keyways cut in the crankshaft.

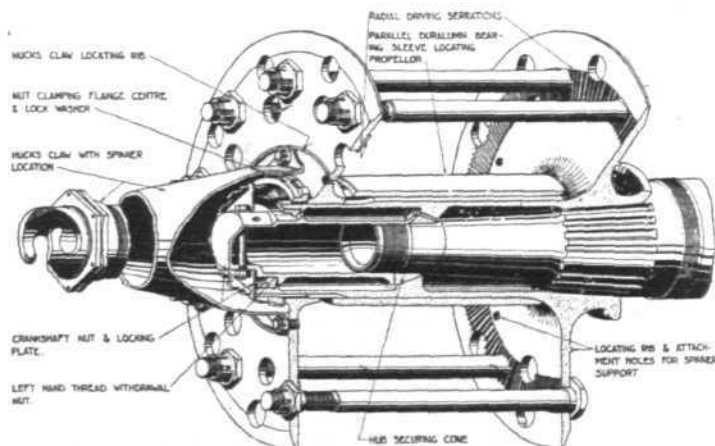
The two B.T.H. magnetos are mounted with their axes forming an angle (as seen in plan view) with the centre line of the crankshaft, and are supported on two hollow spigots projecting back from the rear cover. These spigots are clearly shown in one of the photographs. A laminated spring dog coupling provides the drive, and is shown in a sketch. The coupling is provided with a closely serrated flange engaging with a similar flange on the magneto spindle, thus enabling an extremely fine setting of the spark timing to be obtained.

The only other drive coaxial with the crankshaft is that for the two oil pumps (pressure and scavenger). Details of the pumps will be given later when we come to deal with the lubricating system. For the present it will suffice to point out that the pumps are driven by means of a driving plate which has two notches in its circumference, engaging with two dogs on the tail end of the crankshaft. This driving plate would close the rear end of the shaft but for the fact that it is liberally drilled with holes so as to provide a passage for the oil into the hollow crankshaft.

The offset drives on the standard Series VI range of "Jupiters" are those for the gun-synchronising gear, the

gas starter distributor and the tachometer drive. All these are driven from the crankshaft *via* a spur wheel mounted approximately in the middle of the rear portion of the crankshaft, and engaging with another spur wheel mounted on the forward end of a lay shaft mounted above and parallel with the crankshaft. This lay shaft can be clearly seen in the sectional view which we published on p. 970 of our November 8 issue. At its rear end this lay shaft carries the cam mechanism for the gun gear, and in the direct-drive engines it carries, in an intermediate position, a small bevel which engages with the larger bevel on the lower end of the vertical spindle of the gas starter distributor, which is driven in this way. In the geared engines shown in the sectional view on p. 970, however, the gas starter is not fitted, and in its place is fitted a hand turning starting gear. The fitting of this on the "Jupiter" geared engines does away with the intermediate bevel drive of the gas starter distributor, and in its place is fitted on the lay shaft a worm wheel which engages with the worm of the hand starter turning gear. This gear is shown in one of our photographs, as well as in the sectional view on p. 970, and takes the form of a spring-loaded toggle movement which automatically throws the gear out of engagement when the engine fires normally, or if it backfires. Thus protection for the operator is ensured. The gear reduction provided by the worm gear used is 30 to 1, and it is claimed that this is low enough to enable even the "stickiest" engine to be turned over at a suitable speed for starting.

As already mentioned, when some form of gas starter is used on the aircraft, a special distributor is fitted in place of the hand turning gear. This distributor, a sectional view of which is shown in the sketch of the auxiliary drives, is driven at half engine speed *via* a bevel on its vertical spindle from the bevel on the lay shaft of the gun gear. The mixture, supplied either from the well-known Bristol gas starter or from some other type, enters the distributor through the central union at the top of the distributor and passes to a cone-shaped chamber, at the bottom of which is a rotating disc valve having a hole drilled in it. Nine outlets are provided in the seating below this disc valve, and so arranged that the hole in the valve communicates with them in the proper firing order, the mixture passing from the outlets in



The Bristol "Jupiter" propeller hub: Of the 10-bolt or extended type, this hub lends itself to fairing and spinner, attachment for which is provided.

the distributor to unions on the rear ends of the hollow engine-supporting bolts, and thence by small bore pipes to the non-return valves on the front of the cylinders.

The vertical spindle of the distributor carries also a worm for the tachometer drive.

The drive for the gun-synchronising gear is, as already stated, in the form of cams mounted on the rear end of the lay shaft. As distinct from usual practice, the two gun gear generators point upwards at an angle, the plungers being held out of action by springs. This mounting of the generators gives shorter and simpler pipe lines, and affords protection against accidental damage. The cam rings are provided with fine radial serration type of couplings, so that not only can very accurate timing be provided, but the two guns can be timed separately. By re-designing the standard service components and making full use of light alloys, the weight of this gear has been reduced by approximately 60 per cent.

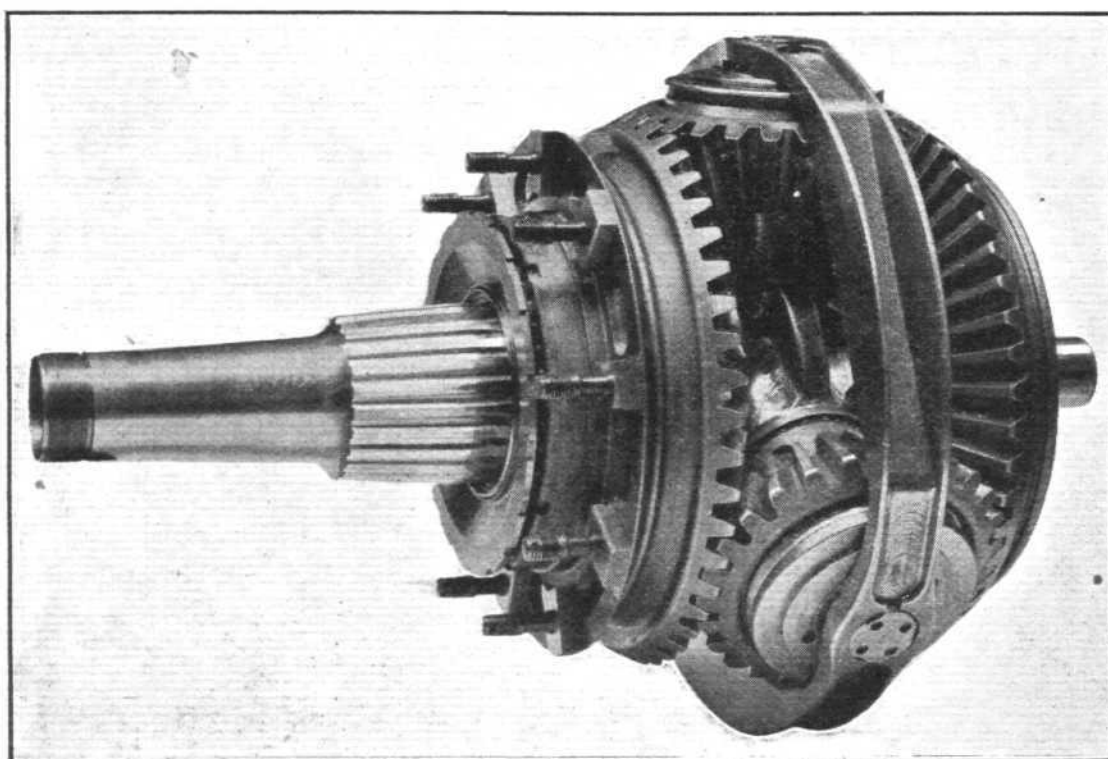
Although not a standard fitting on the Series VI "Jupiters," reference should be made here to the Bristol engine-driven petrol pump, which is fitted on the supercharged "Jupiter"



(Series VII) and on the geared "Jupiters," Series VIII and IX. The Bristol petrol pump, developed by the R.A.E., is of the gear-wheel type, and is driven from the rear end of the gun gear drive shaft through a ball-ended vertical shaft, enclosed in a telescopic Duralumin casing, the pump itself being mounted on the induction elbow. All bearing surfaces are automatically lubricated by the petrol circulating through the pump, and leakage through the shaft casing is prevented by a spring-loaded, cork-packed gland. The pump, which gives a non-fluctuating flow, may be used to supply petrol direct to the carburettor, and a spring-loaded relief valve which can be mounted in any convenient position is supplied, so designed as to by-pass all petrol in excess of the requirements of the engine. The pump weighs but  $3\frac{1}{2}$  lb. and will maintain its output under combined suction and delivery head up to 30 ft., but it should be remembered that the maximum permissible head for the carburettor feed is approximately 12 ft.

on the crankshaft will readily be understood from the sketch. A shoulder with a conical seating is formed inside the hub barrel. A sleeve terminating in a shoulder and cone at the back and in a nut at the front is internally threaded at its rear end to engage with the thread on the forward end of the crankshaft. When the nut is turned, the cone on the sleeve is forced against the internal shoulder of the hub barrel, thereby forcing the hub on to the taper splines. For withdrawing the hub the same nut is used, a left-hand screwed ring engaging an external shoulder on the sleeve thus retaining the nut in the barrel. The cone support for the Hucks starter claw is longer than usual, and provides better facility for attachment of a spinner. The front flange of the hub slides over the end of the barrel, and engages with serrations in the latter. It is locked in position by an annular serrated clamping nut which engages with the external thread on the barrel.

The propeller hub for the geared "Jupiters" is the same



The Farman-Bristol reduction gear fitted on the Series VIII, IX and XI "Jupiter" engines.

### The Propeller Drives

The direct-drive series of "Jupiters," i.e., VI A, VI AM and VI AL, are normally fitted with hubs suitable for wooden propellers, but hubs to take special propellers such as wood propellers with integral fairing, metal propellers with thick hubs, etc., are also manufactured and available. These will, however, be dealt with later, and at present we will confine ourselves to the standard production type of propeller hub.

This is of a type known as the 10-bolt or extended type, from the fact that it is rather longer and has two more bolts than did the type of hub which was previously used as standard. The main features of this new standardised hub are the greater length and stiffness, the radial driving serrations in the flanges, designed to crush into the wood and prevent the propeller from slipping, and the long Duralumin sleeve which allows a plain cylindrical bore to be used in the actual propeller boss.

One of our sketches shows the details of the new standard propeller hub. It will be seen that hub barrel extends rearwards behind the rear flange. The section at the root of the flange is ample and thus gives extra stiffness at this point, while the extension of the barrel ensures that although the flange itself has been moved farther forward, enabling the propeller to clear the exhaust ring by a greater margin, the whole length of the driving serrations on the forward end of the crankshaft are engaged and made to take their full share of the load. The manner in which the hub is secured

as that for the direct-drive models, but is, of course, carried on the forward end of the propeller shaft, and not on the crankshaft. The Farman-Bristol reduction gear is of the self-centralising bevel gear type, and has been thoroughly tried out during the last year or two on a number of different machines. It has been found efficient and reliable, and the 2:1 gear ratio enables much higher propeller efficiencies to be obtained at low forward speeds, such as during the take-off of heavily-loaded and relatively slow machines. The only criticism that can possibly be levelled against it is that it adds a certain amount of weight (about 100 lbs.), and that the gear ratio obtainable is limited.

One of our photographs shows the Farman-Bristol reduction gear, and details were shown in the sectional view of the geared engine published on page 970 of our November 8 issue. The forward bevel is stationary, and is mounted in the front of the gear casing. The rear bevel is mounted on the forward end of the crankshaft. The propeller shaft is coaxial with the crankshaft, its rear end being, in fact, housed in the hollow forward end of the crankshaft. The propeller shaft has formed on it three stub spindles  $120^\circ$  apart, which carry the three intermediate bevel wheels. When the crankshaft is rotated, the propeller shaft is rotated in the same direction, but at one-half the speed. The reduction gear is, in fact, identical with the differential of a motor car if one imagines one of the road wheels locked in position and the propeller shaft driven by rotating the other road wheel.

(To be continued.)

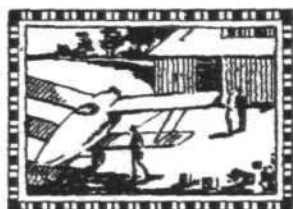
### Congo Development

A NEW air service is to be created in the Belgian Congo running from Leopoldville to Lusambo, Kabalo and Albertville. The landing grounds are being prepared.

### Flying Officer Staniland

It is reported that Flying Officer C. S. Staniland, R.A.F., who is a noted competitor on the racing track, may attempt a world's speed record at motoring.

# PRIVATE



# FLYING

A Section of **FLIGHT** in the Interests of the Private Owner, Owner-Pilot, and Club Member

## BROOKLANDS SCHOOL OF FLYING

### A New Venture

ON Friday, November 9, the newly-formed Brooklands School of Flying, Ltd., was officially opened and despite very bad weather for the first week results were shown. Mrs. W. B. Scott, the racing motorist, and Mr. G. P. Kerr completed their first solos in perfect style. Three new pupils were welcomed, namely Mr. W. T. D'Eyncourt, Mr. E. L. Donner (Guards' Club) and Mr. C. S. Burney, the racing motor cyclist.

The School held an "At Home" at Brooklands on Sunday, November 18, which was a great success. An interesting programme was given with the assistance of many pilots and private owners who included, Miss W. Spooner on her Gipsy-Moth; Capt. G. de Havilland on a Coupé-Moth (Gipsy), Capt. H. Broad on a Gipsy-Moth, Capt. F. E. Guest and Capt. Rodney who arrived on the former's Junkers monoplane, Flying-Officer Summers and Flt.-Lt. E. R. Scholefield, etc.

The programme opened with an exhibition flight by Capt. H. D. Davis, A.F.C., and then Capt. H. Broad gave a fine display of aerobatics on his Gipsy-Moth. Lieut.-Col. Henderson flew a Mono-Avro to show how such a machine can be flown. Many guests were taken up for joy rides on the School machines piloted by Capt. H. D. Davis and Major Pickthorn, Capt. de Havilland (Coupé Moth), Col. Strange (Simmonds "Spartan") and Col. Henderson (Mono-Avro) also helped.

The Brooklands School of Flying has been inaugurated to carry on the work started by Lieut.-Col. G. L. P. Henderson with the Henderson Flying School at Brooklands. When it became known that Col. Henderson wished to retire from School work, a band of enthusiasts, headed by Capt. H. D. Davis, A.F.C. (the Chief Instructor to the old school) offered to take over the School from him and the new School was started. The early association of Brooklands with aviation led to the choice of the new name and it is the aim of the



["FLIGHT" Photographs]

"AT HOME" AT BROOKLANDS; Air visitors and supporters at the flying "At Home" held at Brooklands Aerodrome on Sunday, November 18. (1) Capt. F. E. Guest, M.P. (right) and Capt. Rodney with the former's Junkers monoplane. (2) L. to R. Mr. R. G. Wood, Mr. Oliver, Col. G. L. P. Henderson, Miss Lawrence, Dr. Wall and Mr. Burney. (3) L. to R. Flt.-Lieut. E. R. Scholefield, Capt. H. Broad, Dr. Lindsay, Capt. G. de Havilland and Mrs. Lindsay. (4) L. to R. Sir Philip Richardson, M.P., Capt. H. D. Davis, Dr. Howard Humphris, and Miss Blanch.



directors to carry on the old Brookland traditions. Their object is to turn out the finest possible type of pilot. Most people now can steer a motor car along without much trouble but only a small percentage of those people can drive a car. Much the same applies to flying. A great many people can take up a machine and bring it down again without breaking it but their object is to teach a pupil to be in harmony with his machine and to realise that he is its master.

All the capital of the firm has been subscribed by pupils, which is evidence of faith in the methods employed.

For the time being, the board has decided to use Avros as the preliminary training machines.

The firm has its own bungalows on the Aerodrome for the convenience of pupils and those able to spare the time are recommended to make use of them. The obvious advantage is that one can get lessons in the early morning and be on the spot to take advantage of the best weather.

They encourage pupils to go into the workshops while waiting their turns to fly and learn the mechanical side of aircraft, maintenance and overhaul. Ground instruction is free. They are always willing to give a trial lesson to anyone who may be thinking of taking up flying. No obligation to continue flying is incurred and the charge is £1. Brooklands Aerodrome is situated on private property and the school has an arrangement with the Brooklands Automobile Racing Club which secures admission free for their pupils to the ground at all times. The nearest railway station is West Weybridge which is within easy walking distance of the track.

Directors of the new School are Capt. H. D. Davis (Managing Director), Mr. H. S. Hamilton (Secretary) and Mr. L. R. Oldmeadow. It is the intention of the directors to make a special point of week-end flying and they welcome any private owners and those interested any week-end.

## LIGHT 'PLANE CLUBS

**London Aeroplane Club**, Stag Lane, Edgware. Sec., H. E. Perrin, 3, Clifford Street, London, W.1.  
**Bristol and Wessex Aeroplane Club**, Filton, Gloucester. Secretary, Major G. S. Cooper, Filton Aerodrome, Patchway.  
**Cinque Ports Flying Club**, Lympne, Hythe. Hon. Secretary, R. Dallas Brett, 114, High Street, Hythe, Kent.  
**Hampshire Aero Club**, Hamble, Southampton. Secretary, H. J. Harrington, Hamble, Southampton.  
**Lancashire Aero Club**, Wodford, Lancs. Secretary, F. W. Atherton, Wodford Aerodrome, Cheshire.  
**Liverpool and District Aero Club**, Hooton, Cheshire. Hon. Secretary, Capt. Ellis, Hooton Aerodrome.  
**Midland Aero Club**, Castle Bromwich, Birmingham. Secretary, Major Gilbert Dennison, 22, Villa Road, Handsworth, Birmingham.

**Newcastle-on-Tyne Aero Club**, Cramlington, Northumberland. Secretary, J. T. Dodds, Cramlington Aerodrome, Northumberland.  
**Norfolk and Norwich Aero Club**, Mousehold, Norwich. Secretary, G. McEwen, The Aerodrome, Mousehold, Norwich.  
**Nottingham Aero Club**, Hucknall, Nottingham. Hon. Secretary, Cecil R. Sands, A.C.A., Imperial Buildings, Victoria St., Nottingham.  
**The Scottish Flying Club**, 101, St. Vincent Street, Glasgow. Secretary, Harry W. Smith.  
**Southern Aero Club**, Shoreham, Sussex. Secretary, C. A. Boucher, Shoreham Aerodrome, Sussex.  
**Suffolk Aeroplane Club**, Ipswich. Secretary, Maj. P. L. Holmes, The Aerodrome, Hadleigh, Suffolk.  
**Yorkshire Aeroplane Club**, Sherburn-in-Elmet, Yorks. Secretary, Lieut.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.

### LONDON AEROPLANE CLUB

REPORT for week ending Nov. 18.—Pilot instructors: V. H. Baker, F. R. Matthews. Ground engineer: C. Humphreys. Aircraft: The following machines were in commission during the week:—G-EBNY; G-EBXS; G-EBMP. Total flying time for the week: 37 hrs. 5 mins.

Dual instruction: 28 members were given dual instruction during the week, the flying time being 21 hrs. 5 mins.  
Solo flying: 22 members made solo flights during the week, the time being 16 hrs.

Accommodation at Stag Lane: The following committee has been appointed to take in hand the fitting up of the members' rooms:—Maj. K. M. Beaumont, D.S.O., Capt. A. G. Lamplugh, T. Elder Hearn, J. W. P. Chalmers, R. C. Presland.

Christmas Raffle:—The raffle of the D.H. Moth, Cirrus Mark 1, complete with C. of A., will be made in December. Individual tickets at 10s. each or books containing 10 tickets can be obtained on application to the Club at 3, Clifford Street, London, W.1, or Stag Lane Aerodrome. It is hoped that members will assist in the disposal of the tickets to their friends.

### BRISTOL & WESSEX AEROPLANE CLUB, LTD.

REPORT for the week ending November 17.—Pilot instructor for the week: E. B. W. Bartlett. Ground engineer for the week: A. W. Webb. Machines in commission: two, G-ERYH and G-EBTV. Flying time for the week: 7 hrs. 35 mins. Pupils under instruction (5), 3 hrs. 55 mins. Number of "A" pilots flying (4), 2 hrs. 45 mins. Number of passengers carried (2), 20 mins. Number of test flights (5), 35 mins.

There has been very little time during the week suitable for instructional flying. We have made the most of what little there has been. We have nothing of interest to report.

### CINQUE PORTS FLYING CLUB

REPORT for week ending November 17.—Pilot instructor, Maj. H. G. Travers, D.S.C. Ground engineer, Mr. R. H. Wynne. Machines:—Moth G-EBNN, and G-EBYJ. Total flying time for week, 4 hrs. 35 mins. Dual instruction:—Mr. Worsell, 30 mins.; Mr. Law, 15 mins.; Mr. Somerset, 30 mins. Total, 3; 1 hr. 15 mins.

Soloists under instruction:—Mr. Martin, 30 mins.; Mr. Sargent, 1 hr.; Mr. Somerset, 30 mins. Total 3; 2 hrs.

"A" Pilots:—Mr. Douglas, 15 mins.; Mr. R. Dallas Brett, 15 mins. Total 2; 30 mins.

Joyrides: Two; 45 mins.  
Test flight: One; 20 mins.

Two great gales are responsible for our small flying time this week. Sunday, 11th, was fine in the morning, but during the afternoon, the clouds came right down on to the aerodrome and spoiled what promised to be a good day.

During the second gale, the anemometer registered gusts up to 82 m.p.h. and Capt. Armstrong, of Imperial Airways, put up a fine performance in putting down a W.10 containing three very sick passengers at Lympne. It is reported that the handling staff who took hold of the Handley Page to bring it into the hangar had the unpleasant experience of being taken for a short joyride while strap-hanging to the machine when it was lifted off the ground by a tearing gust. However, nothing was broken, and Capt. Armstrong and his W.10 succeeded where the Channel boats failed. A good show.

On Saturday, 17th instant, the Club's new "A" licence pilot, Mr. H. R. Law, made an excellent cross-country flight to London in V.J. and hazy weather. As Mr. Law had only done about 4 hrs. solo flying prior to this, his performance was extremely praiseworthy. As his time is not yet known, it is not included in the hours flown for the week.

### HAMPSHIRE AEROPLANE CLUB

REPORT for week ending November 17.—Pilot Instructors: Flt.-Lieut. F. A. Swaffer, M.B.E., and Mr. W. H. Dudley. Ground engineers: Mr. E. Lenny and Mr. J. Elliott. Aircraft: D.H. 60 Moths, G-EBOL and G-EBOH.

Flying time for the week 24 hrs. 10 mins. Pupils under instruction (23), 14 hrs. 10 mins. Soloists (5), 2 hrs. 15 mins. "A" Pilots (10), 5 hrs. 25 mins. Passengers (3), 1 hr. 10 mins. Tests (8), 1 hr. 10 mins.

There has not been much flying this week owing to gales. The wind indicator is torn to ribbons and the hangars are minus several slates. No new members have been enrolled, no one has made a first solo flight, nor has anyone completed the tests for his "A" Licence. However, we have not been entirely idle.

We gather that the Chief Instructor has written a book on how to fly without the aid of aeroplanes. The Chief Ground Engineer has invented a new what-not out of which he may, or may not, make his fortune. The Chief (and only) Steward has laid in a fresh stock of comparatively rare, and possibly refreshing, wines. The Chief Secretary—but no, we feel that in this case another adjective is more frequently employed. The typist has got the filing up to date, and the very unchief boys (we should say the Assistant Ground Engineer and the deputy assistant Ground Engineer) have been wielding the paint brush faithfully in order that our machines may shine like new pins when we do see the sun again.

### LANCASHIRE AERO CLUB

REPORT for week ending November 10.—Flying time, 14 hrs. 55 mins. Instruction (14), 5 hrs. 5 mins. Solo flights (29), 8 hrs. 20 mins. Passenger flights (4), 40 mins. Tests (7), 50 mins.

Instruction (with Mr. Hall): Foote, Weale, Miss Baerlein, Kay, Miss Emery, Whitehouse, Chart, Eckersley, Gort, Gattrill. Two machines in commission—G-EBXD, G-EBPH.

Soloists (under instruction): Eckersley, 35 mins.  
Pilots: Cohen, Michelson, Hall, R. F. Gort, Meads, Weale, Mills, Ruddy, Lacayo, Nelson, D. Gattrill. 7 hrs. 45 mins.

Passengers (with Mr. Hall): R. F. Meads; (with Mr. Lacayo): Mrs. Crook, Miss Mitchell; (with Mr. Gort): Walker.

REPORT for week ending November 17.—Flying time, 5 hrs. 35 mins. Instruction (8), 2 hrs. 30 mins. Solo flights (5), 1 hr. 35 mins. Passenger flights (2), 40 mins. Tests (5), 50 mins.

Instruction (with Mr. Hall):—Davies, R. G. Eckersley, Whitehouse, Foote, Miss Baerlein, Chart. Two machines in commission—XD, PH. Pilots: Michelson, Hall, R. F., Lacayo, Twemlow, Mills. Passengers: (with Mr. Cantrill): Percival; (with Mr. Gort): Lloyd.

### LIVERPOOL & DISTRICT AERO CLUB

REPORT for week ending November 17.—Machines in commission XY, WK Avians. Instructor, Mr. J. B. Allen: Ground engineer, Mr. Howard Pixton. Total flying time, 12 hrs. 50 mins. Sixteen pupils flew 9 hrs. 30 mins. Two soloists totalled 50 mins. "A" Pilots totalled 1 hr. 55 mins. Seven test flights, total, 35 mins.

The weather has been more suitable for a preliminary course in Arctic Exploration than learning to fly.

### MIDLAND AERO CLUB

REPORT for week ending November 17.—Total flying time, 11 hrs. 4 mins. Dual, 4 hrs. 35 mins. Solo, 5 hrs. 15 mins. Passenger, 35 mins. Test, 39 mins.

The following members were given dual instruction by Flt.-Lieut. T. Rose, D.F.C., and Mr. W. H. Sutcliffe:—F. D. Scott, C. T. Davis, C. W. R. Gleeson, F. J. Steward, Mrs. Leigh-Fermor.

"A" Pilots:—E. P. Lane, W. M. Morris, R. L. Jackson, J. Rowley, G. Robson, S. Duckitt, J. Cobbe.

Soloists:—F. D. Scott, M. C. Wilks, J. K. Morton, W. L. Handley, J. W. Astley.

Passengers:—F. J. Steward, C. W. R. Gleeson.  
Extremely bad weather has considerably restricted flying.

# NEWCASTLE-UPON-TYNE AERO CLUB

REPORT for week ending November 18.—Pilot instructor: G. M. S. Kemp. Ground engineer, K. C. Brown. Assistant ground engineer, J. Tait. Machines Three. PT, QV, LX. Flying time for week, 18 hrs. 55 mins. Instruction (7): 12 hrs. 30 mins. "A" Pilots (10): 5 hrs. 5 mins. Passengers (2): 50 mins. Tests (3): 30 mins.

The Club's fifth annual dance was held in Newcastle last Friday, and we were pleased to see a goodly number of members and friends present. Mr. Billy Merson, who was appearing in the town, gave us a visit and his songs were much appreciated.

# SCOTTISH FLYING CLUB, LTD.

REPORT for week ending November 17.—Pilot Instructor, Mr. R. M. Stirling. Ground Engineer, Mr. W. Calder. Machines in commission during week, X Moth G-EBYG; Avro Avian, G-EBTY. Dual instruction, 5 hrs. 45 mins. Solo flying, 1 hr. 20 mins. Passenger flights, 3 hrs. 45 mins. Tests, 1 hr. 10 mins. Total flying, 12 hrs.

Instruction (with Mr. Stirling): Miss Hendry, Mr. Fairweather, Mr. Primrose, and Mr. Sinclair.

Flying during the week was greatly hampered by almost incessantly wet weather and by the consequent state of the landing ground, but, in spite of this, the enthusiasm shown by members in taking advantage of every bright spell was very gratifying.

The social evening held on Tuesday in conjunction with the visit of Sir Selton Brancker, proved most successful, and was thoroughly enjoyed by all. In the course of a short address, Sir Selton explained very clearly the position of the clubs with regard to the proposed Guest Scheme, and advised us to approach it with a broad mind and with a due regard to the progress of aviation as a whole. During the evening, the Badminton Section played off an American Tournament under the control of Mr. J. C. Houston. After some interesting play, the winners were announced to be Miss Elizabeth Anderson and Mr. G. C. Walker.

The sudden and altogether unlooked for closing down of the Reserve Training School at Moorpark Aerodrome, on the instructions of the Air Ministry, has reduced the aerodrome personnel very considerably, and, besides depriving the club of very excellent neighbours, has had a most depressing effect on those most interested in aviation matters in Scotland.

# SUFFOLK & EASTERN COUNTIES AEROPLANE CLUB

REPORT for week ending November 17.—Instructor: G. E. Lowdell, A.F.M. Ground engineers: "C," E. Mayhew; "A," G. Keeley. Two Blackburn "Bluebirds": RE and UH. Flying time, 9 hrs. 45 mins. Eight members were given dual instruction (1 hr. 30 mins.). Flights were made by two "A" Pilots (25 mins.). Four passengers were carried (10 mins.). Four tests were made (20 mins.).

The weather was not very favourable for flying, consequently there is little of interest to report.

**The Cambridge Aeroplane Club.**—The Cambridge Aeroplane Club, a branch of the Suffolk and Eastern Counties Aeroplane Club, has now been opened. Flying takes place on Mondays and Thursdays from 10 a.m. to half-an-hour before sunset. Members joining this branch before the end of 1928 will be excused the entrance fee of £3 3s. and will only have to pay the first annual subscription of £3 3s. The flying charges are £1 10s. for dual instruction per hour, and £1 an hour for solo flying. Members of this branch may fly at Hadleigh when the Cambridge branch is not open and, of course, Suffolk members may go to Cambridge. As soon as the Cambridge membership warrants a second instructor will be engaged and flying will take place at Conington aerodrome every day. The aerodrome is 1 mile from the Cambridge-Huntingdon road and is 9 miles from Cambridge. It is easily accessible from Bedford, Huntingdon, Peterborough, etc. Further particulars may be obtained from the Secretary, Hadleigh Aerodrome, Hadleigh, Suffolk, or from the hon. secretary of the Cambridge Aeroplane Club, Mr. J. W. Wedd, The Cross, Melbourn, Cambs.

**The Ipswich-Cambridge Airway.**—A bi-weekly air service in connection with the Suffolk and Cambridge Aeroplane Clubs will be operated between Ipswich and Cambridge on Mondays and Thursdays, leaving Hadleigh Aerodrome at 9 a.m. and returning from Conington at 3.30 p.m. The fares are £1 10s. single and £2 10s. return. Seats may be booked on application to the Secretary, Hadleigh Aerodrome.

# Regina Flying Club, Canada

A CANADIAN report of the Regina Flying Club in Saskatchewan claims that the club has to its credit a greater number of flying hours than any other club on the prairies. Figures quoted in support of this are 303 hours for Regina, 226 hours for Edmonton, 77 hours for Victoria and 37 hours for Calgary. The City has set aside a large tract of land and 7,000 dollars is being spent on its development as a flying field. The Flying Club, the City, and Commercial Airways, Ltd., are all helping to promote aviation in the vicinity. Hon. Secretary of the club is Mr. R. A. Delhaye; the Manager of Commercial Airways, Ltd., is Mr. Oliver Dean, and the City Clerk is Mr. G. Beach. Regina ranks today as the fourteenth city in the Dominion and has a population of 50,000. It is the capital city of the Province of Saskatchewan.

# Captain H. Balfour—Parliamentary Candidate

PRIVATE owner pilots will in all probability be represented in the next Parliament by one of themselves. Captain Harrington Balfour, M.C., who owns a D.H. "Moth X" (Cirrus Mk. II), has been chosen as prospective Conservative candidate for the Isle of Thanet in place of the retiring member, Mr. Esmond Harmsworth. If he succeeds, which seems likely, for the present member had a majority of 10,149 at the last election, Capt. Harrington Balfour will, we believe, be the first private owner pilot to become a Member of Parliament. His prospective programme will essentially specialise on air matters. During his election campaign he will use his machine, no doubt operating from the aerodrome at Manston. He has relinquished his position as General Manager of Metal Propellers, Ltd., Croydon, and joined the Board of Directors.

# YORKSHIRE AEROPLANE CLUB

REPORT for week ending November 17.—Pilot instructor: G. R. Beck. Ground engineer: R. Morris. Machines in commission: 2 (RF and TB). Flying time: 2 hrs. 55 mins. Instruction (1): 35 mins. "A" Pilots (3): 1 hr. 25 mins. Passengers (1): 40 mins. Test flights (3): 15 mins.

This week's hours tell their own tale!

We regret to announce that Col. Walker was taken ill very suddenly on Thursday last and has been removed to a nursing home. We all join in wishing him a speedy recovery.

# FROM THE FLYING SCHOOLS

# Brooklands School of Flying, Ltd., Brooklands Aerodrome

REPORT for week ending November 18.—Instructors: Capt. H. D. Davis, A.F.C.; Maj. Pickthorn. Ground engineers: W. A. Watts; W. H. Hellon. Machines in commission: Avros G-EBVE and G-EBWJ. Flying time: 15 hrs. 30 mins. Pupils under instruction (10): 11 hrs. 45 mins. Soloists (2): 40 mins. "A" Pilots (2): 1 hr. 5 mins. Joy Riding: 2 hrs.

# The De Havilland Flying School, Stag Lane Aerodrome

REPORT for week ending November 19.—Total: 43 hrs. 5 mins. Flying instruction (Dual), 13 hrs. 20 mins.; (Solo), 15 hrs. 50 mins. Other flying: 13 hrs. 55 mins.

In common with the rest of the country, we have experienced continuous bad weather during the week, nevertheless six new "Gipsy Moths" were tested and delivered and several more are ready for their initial flight.

Some of the new workshops at Stag Lane aerodrome are now nearing completion and the production of "Gipsy Moths" should greatly increase in the near future.

It is pleasing to note that Capt. Malcolm Campbell has found his "Gipsy Moth" of great service in his search for a suitable speedway in Africa on which to attack the motor-car speed record, and we wish him every success on his next attempt.

Another of the popular dances organised by the D. H. Sports Club is to be held on Wednesday, November 28, at the Arcadia Dance Salon, Finchley.

# OVERSEAS CLUBS

# SINGAPORE FLYING CLUB

REPORT for week ending September 29.—Total flying time, 24 hrs. 53 mins. solo, 6 hrs. 35 mins. Dual, 17 hrs. 2 mins. Passenger flights, 1 hr. 5 mins. Tests, 11 mins.

On September 26, W. M. Blagden, who already holds an "A" licence on landplanes, obtained with the Lancashire Aero Club, successfully accomplished his first seaplane solo. During the week under review, W. I. L. Legg passed his figures of eight and altitude tests for "A" licence.

The weather on the whole was favourable though we were on several occasions handicapped by mist in the early mornings rendering dual instruction somewhat difficult.

Valuable help has been rendered by Flt./Lt. D. V. Carnegie and F./O. G. E. Nicholletts, who have been giving dual instruction to several members.

G-EBUJ sank at its moorings on the night of 3rd/4th October, but was salvaged with no damage other than sea water. It is being completely dismantled and overhauled and should be ready for flight in the course of the next ten days.

REPORT for week ending October 13.—Total flying time, 23 hrs. 15 mins. Solo: 10 mins. Dual: 20 hrs. 5 mins. Photography: 1 hr. Joy Ride: 1 hr.

In view of the fact that we have had only one machine available during the week, the flying time put in may be considered very creditable.

It has been found necessary to re-cover the main planes and fore part of the fuselage of G-EBUJ, which sank at her moorings last week, and it is feared that this machine will not be ready for use for another 10 days. The engine had suffered comparatively little through its immersion, but the opportunity has been taken to give it a complete overhaul.

# Moose Jaw Flying Club

IT is planned to commence work on the erection of a new hangar for the Moose Jaw Flying Club in Moose Jaw, Sask., in the very near future. The city of Moose Jaw is contributing \$2,500 to the cost of the building. The former hangar was destroyed by fire a little while back. This club, in the number of hours flown since its inception, has the record for the whole of Western Canada, and is fourth in the Dominion in this respect, the time amounting to 426 hours.

# Calgary Club's First "Ticket"

FRED KRAEMER, of the Calgary, Alberta, Club, is the first Calgary student to pass the aero club tests and to make his solo flight. Nearly 50 students have been taking the flying course conducted by the club.

# Private Owners and the Air Routes

AT the Air Ministry a conference was recently held and attended by firms who operate the air services to the Continent, to consider how to avoid the risk of collisions on the routes, which are threatened by the growing use of them by private owners and club pilots.

# Sheffield's Municipal Aerodrome

THE site for the new aerodrome and landing ground at Coal Aston, Sheffield, which the Corporation proposes to acquire by a provisional order, is considerably greater in extent than the present aerodrome, which covers 110 acres, but the new ground will cover 230 acres. The former is separated from the Chesterfield road by several fields, but when the new scheme is brought into operation the municipal landing grounds will abut on the road.



# ROYAL AERO CLUB DINNER TO SQDN.-LDR. "BERT" HINKLER

SQDN.-LDR. "BERT" HINKLER, A.F.C., was the guest of honour on November 14 at a dinner held by the Royal Aero Club. In the chair was Lord Thomson, the ex-Minister for Air. In his opening remarks Lord Thomson said that they were not only gathering together themselves but to do honour to Hinkler. He had rendered a great service to aviation and had shown what a man could do by himself.

Sqdn.-Ldr. Hinkler, in reply, said that he was sensible to the great honour they did him that evening. Concerning the reasons for his flight to Australia, he said that, in the first place, he wished to get to Australia because it was his home, and there was also some urgent business to attend to. Flying being his business, and possessing an aeroplane, he thought that the best way was to fly there. On the way, at the start, it was very foggy, and he never saw France until near Lyons. Down the Rhone Valley he was flying at 100 ft., and a south-east wind almost stopped his hopes of making the stage (London-Rome) non-stop.

It had been his intention, he explained, to fly via Corsica, but the adverse conditions stopped that. At dusk he was between two aerodromes and over unknown country. He remembered Rome from a previous experience, and it made him feel that he could pick it up. At 8.30 in the evening the moon rose and helped him to see the lights of Rome. Then he saw red signals, and thought at first that Rome was more up-to-date than Croydon, and he had a pleasing feeling that the aerodrome was in sight. But the red lights proved to be huge advertisements.

The machine was running well, however, and there were six hours' petrol left, enough for flying until dawn. He felt there was nothing to worry about, although his past experience of Rome had been by daylight. For three-quarters of an hour he looked for the aerodrome and wondered if they had sold the place. Came 9 p.m. (and his bed-time), but there was nothing to do other than search. Flying 10 miles out of the city, he came back flying zig-zag. When giving up hope he saw the outlines of the aerodrome. He flashed a pocket lamp down, with no result. He tried to show that he was landing, but still came no results. Finally he landed with no trouble.

Continuing, Sqdn.-Ldr. Hinkler said that the next stage, Malta, was a real joy. Weather was wonderful, and flying was just like sitting in a nice cool breeze while the world slipped by. It took six hours, and there was the only following wind of the whole journey. He observed that we could compliment ourselves at the fine reception obtained when landing at any R.A.F. aerodrome. At Malta, although the ground was very soft, the machine got off well with full load. For seven hours he was looking at the Mediterranean. The song of the exhaust was merry and bright, but one could not help thinking of things. However, he arrived at Bengasi, on the North African coast, within four miles, although having made many detours. In Africa he met the first real tropical weather. He found the Colonial Italians just like our R.A.F. They were exceedingly helpful.

Then came the first slight mishap. At sunset he was obliged to land in the desert. He saw a place which looked suitable, but, on coming closer, what was thought were spots were camel-thorns or tufts feet high. The machine landed on that rough ground, however, without doing any damage, and he realised then how important was the metal airscrew! He spent a real pleasant night in the desert on his rubber boat! Arabs arrived in the morning. At first he had to sum up his geography to see how we stood with those people. It made all the difference on whose side they were! But he soon had the Arabs working for him! They cheered his ascent with great enthusiasm. In half-an-hour he reached Tobruk.

There was a second night landing in the desert later amongst Arabs. Cigarettes were the bond of peace. In the morning he flew on to Ramleh. Starting at dawn the following day, after flying over the desert, he arrived at Basra, 950 miles in 9½ hours. There he was in touch with Imperial Airways. At dawn again he left Basra, and noted that one could almost sum up the age of the earth round Persia. There was a lack of landing grounds there, but the water provides wonderful facilities for water craft.

At Jask was one of the largest and best aerodromes he had seen, though it was hard. At Jask, too, Mr. Janes, of the Indo-European Telegraph Co., had been a real friend to anyone who had passed that way. After Jask came Karachi. Flying was interesting there. The water was so blue. He owed thanks to the R.A.F. at Karachi. His tank had developed a leak, which the R.A.F. repaired. Thickening

strips were also put on. As long as we built tanks with flat sides they would always pant and then crack, he remarked. We must put a curve in them. He landed at Cawnpore owing to the toppee he was wearing making his head rattle until it became unbearable. He lay down there with no desire to go any further, but the rest did him good.

Incidentally, it was surprising how bad the visibility could be in the tropics, although above was a blue sky and a burning sun. He was looked after at Calcutta by Mr. Leete and Mr. Ketch, who were establishing a civil aviation business there. (Our readers will remember that Mr. B. S. Leete was Capt. N. Stack's companion on their record flight to India in 1926-7.) An Avro Baby, continued Sqdn.-Ldr. Hinkler, was at Calcutta, still flying. Visibility was very bad to Victoria Point, and after passing Penang he began to get to the monsoons. At Singapore he met Capt. Lancaster and Mrs. Keith Miller (who were held up there in the course of their flight to Australia in an Avro "Avian"). They helped him.

When he went to school, he observed, he was told that three-fifths of the world were ocean and the rest land. But he thought that that was a very modest estimate. He noted there was a Dutch School of Flying at Batavia, and also found an Avro 504K there. At Bima the Dutch Commissioner was very hospitable. The Dutch emergency ground there was fine, but there were no facilities.

He left Bima for Darwin, 1,000 miles, and got over the mountains with full load at 3,000 ft. He continued over the water for 5 hours, then came the Island of Timor, a fine stepping stone. For a further 500 miles he flew over the sea. Near the Australian coast the water was very clear and he could see a marine forest at the sea bottom. The coral and sea life were most interesting. At Darwin he got the first experience of the interest that had been taken in his flight.

The flying time from England to Australia was 128 hours. There was no replacement, spares carried being still in the same position as when leaving Croydon. It was an important trip for he carried cargo, which was a case of whiskey. That arrived untampered with! In Australia he did 200 hours' flying.

The A.D.C. "Cirrus" Mark II in his Avro "Avian" G-BOV, gave the same number of revolutions to this day, and the consumption was about the same. The machine had done 35,000 miles and its condition was as good as new. The Fairey metal airscrew used was recently tested by the Fairey Aviation Co. and found to be not one minute out!

In conclusion, Sqdr.-Ldr. Hinkler again thanked Lord Thomson and those present for the honour they did him that night.

Lord Thomson then rose and said he felt they had listened to one of the most complete and marvellous descriptions that could be given.

Mr. Handley Page also paid generous tribute to the chief guest, emphasising his admiration for his "courage." What most pleased him was not so much that it was a British machine and British engine, etc., that was concerned but that it was also someone with British "courage."

Mr. John Lord, of A. V. Roe and Co., Ltd., and Col. M. O. Darby, of the A.D.C. Aircraft Co., Ltd., also paid brief tributes.

Sir Francis K. McClean concluded the proceedings by proposing a vote of thanks to the chairman, Lord Thomson, which was appropriately given.

Amongst those present besides those mentioned above were: Mr. R. J. Wallace Barr, Sqdr.-Ldr. T. England, Maj. R. H. Mayo, Capt. R. J. Goodman-Crouch, Mr. Griffith Brewer, Capt. A. G. Lamplugh, Mr. W. O. Manning, Mr. M. L. Bramson, Capt. E. W. Percival, Commander H. Perrin, Mr. Morris and Capt. Olley.

A film of Sqdr.-Ldr. Hinkler's flights in Australia was exhibited at Australia House, Strand, London, on November 16. It gives an excellent idea of the public enthusiasm he aroused. Close up views of him in flight, aerial views of the various important towns and his arrivals make an absorbing film. Sqdr.-Ldr. Hinkler was present.

This morning, November 22, Sqdn.-Ldr. "Bert" Hinkler will be received in audience at Buckingham Palace to receive from His Majesty The King the Air Force Cross awarded to him for his record flight to Australia. His rank as Squadron Leader was conferred upon him by the Royal Australian Air Force.



## AIRISMS FROM THE FOUR WINDS.

### Great Flying-Boat Cruise

THE four R.A.F. Supermarine "Southampton" flying-boats on the Far East flight, under the command of Group-Captain H. M. Cave-Browne-Cave, reached Hong-Kong on Nov. 18, from Manila. They are due to return to Singapore by December 11.

### Capt. M. Campbell's Flight

THE flight to Africa for the purpose of surveying for a stretch of sand suitable for motor-record attempts by Capt. Malcolm Campbell progressed as far as Reggan in the Sahara Desert. This place was used as the base for the survey flights by Capt. Campbell with his pilot, Flight-Lieut. Don, in the former's Gipsy-Moth, in which they left Croydon on November 3 last. Capt. Campbell found a site at a point in the Sahara Desert 95 miles from Tasurirt. On the return flight from Africa, Capt. Malcolm Campbell and Flight-Lieut. D. Don made a forced landing in the sea off the coast of Morocco in the Riff country, on November 18. The machine was temporarily abandoned, and they walked 16 miles to the Spanish post. Both were unharmed. The Spanish High Commissioner sent a vessel to safeguard the machine and Spanish soldiers also gave assistance.

### African Air Tourists

FLIGHT-LIEUT. R. R. BENTLEY and Mrs. Bentley arrived in their D.H. "Moth" (Cirrus) at Jinja, Uganda, on November 19, in the course of their flight from England to Cape Town. Another light plane tourist, Capt. S. Halse, reached Jinja recently in his Gipsy-Moth. He left London for South Africa some time ago.

### German Flight to Tokio Finished

BARON VON HUNEVELD, the German airman, returned to Berlin recently after a flight to Tokio with the Swedish pilot, Lindler.

### Belgian Military Flight

IN the spring a squadron of seven Belgian military aircraft of the Breguet type fitted with Hispano-Suiza engines, will attempt a flight from Brussels to the Congo. They will try to complete the flight in six stages and pass over the Sahara on the way. Each machine will carry a pilot, observer and mechanic, all of whom will be Belgian officers and non-commissioned officers.

### East Indies Air Mail

THE fifth Fokker monoplane (Armstrong-Siddeley "Lynx" engines) which made the flight from Amsterdam to Batavia recently to inaugurate the air mail service, arrived back at Amsterdam after a flight of only nine days. The other four Fokker machines will remain in the Dutch East Indies service.

### Australia-England Flight

THE Ryan monoplane "Spirit of Australia," flown by Capt. F. Hurley and Flying Officers Moir and Owen, which is flying from Australia to England, landed at Bander Abbas on November 16 owing to a dust storm. The Persian authorities refused to allow them to continue as their permit only provided for a landing at Bushire.

### Capt. R. Amundsen

THE King of Italy has made the posthumous award of the gold medal for valour to Capt. Amundsen, the explorer, and Commandant Guilbaud, the French pilot, both of whom were lost with other members of their crew in the Latham flying boat, which left Tromsø for King's Bay on June 18, to go to the rescue of the *Italia's* airship crew. A silver medal is also awarded to the memory of Major Penso and a bronze medal to that of his two companions who lost their lives in the Rhone when their machine crashed on its return flight from King's Bay, Spitzbergen.

### Canada Prepares Big Mooring Mast for the R.100

ACCORDING to the Canadian Department of National Defence at Ottawa, the large mooring mast now under construction at Saint Hubert, Quebec, in preparation for the arrival of the giant airship R.100 now nearing completion in England, will be ready to receive the dirigible this autumn, although no notice as to the actual date of the proposed transatlantic flight has yet been published. According to the Department, steps have been taken to

give the fullest possible co-operation as soon as the airship is prepared to start its flight. Charts have been prepared dividing the Atlantic into meteorological zones, and during the trip Canadian land stations or ocean vessels are expected to be in constant wireless communication with the craft, to give warnings of any storm conditions.

### A Seaplane Harbour for Montreal

FURTHER particulars are to hand of Montreal's new harbour for seaplanes, in the vicinity of the plant of Canadian Vickers, Ltd., at Maisonneuve. Two breakwaters, 300 ft. in length, will be built out into the St. Lawrence River to provide comparatively calm waters for mooring machines, and two floating platforms will be installed to enable aviators, passengers, or other interested parties to embark or land from the machines. The location of the harbour is considered ideal in every respect, an area 4,000 ft. by 2,000 ft. providing adequate space for machines to moor and take-off. The new air harbour will be equipped with Customs and Immigration buildings and every facility, including flood lights and other aerial beacons for night flying. The project has the approval of both the Montreal Harbour Commission and the Department of National Defence.

### New North Pole Airship Expedition

IT was reported in the *Daily Telegraph* of November 21 that an agreement had been reached between Dr. Eckener, the German airship commander, and Dr. Nansen, the explorer, for a joint exploration of the North Polar regions by means of the Graf Zeppelin airship. The flight is expected to last ten days, and will probably start in the New Year.

### France-Chili Air Line

THE first air mail from France to Chili reached Santiago de Chile on November 19, having been conveyed by aircraft from Buenos Aires. The mail left Toulouse on November 9, and therefore arrived in ten days, which is record time.

### New Inland Air Line

ON November 19 an air line between Ipswich and Cambridge was started with a return flight by a Blackburn "Bluebird." A report states that the service will be run on Mondays and Thursdays, and the fares will be 30s. single, and 50s. return. The terminals were Hadleigh Aerodrome for Ipswich and Conington Aerodrome for Cambridge.

### Yukon Air Mail Inaugurated

THE first regular air mail in the Yukon Territory was successfully inaugurated on October 13, when the Pickering Royal Air Mail Line's Fairchild plane left White Horse for Dawson with 650 lbs. of first-class mail.

### New Air Links

AIR lines linking Rome, Genoa, and Barcelona, and Rome, Syracuse and Tripoli were started on November 15. The machines used are Dornier-Wal flying-boats and the three principal ports of Western Mediterranean are now linked by air.

### Big Game Hunting Expedition's Mishap

COMMANDER G. KIDSTON, who was flying to Kenya in his Fokker monoplane to take part in big game hunting, crashed at Tombe Channel, 30 miles from Bol, Sudan, recently. A steamer sent from Mongalla picked up his party. The pilot, Capt. D. Drew, intends to return shortly to salvage the machine.

### Aerial Dusting in North Bay, Ont.

A NEW De Havilland seaplane recently carried out aerial dusting operations in the territory about the Soo for the purpose of exterminating the spruce bud worm and hemlock looper. The local officials of the Ontario Forestry Department state that very gratifying results were obtained by the dusting operations.

### A Canadian Air Port

BROCKVILLE, Ontario, is to have an air port to serve in the Montreal-Toronto route, and plans are now being carried out to this end on a river front property west of the town which is well suited as a landing field.

### Edinburgh and Aviation

A PROPOSAL has been made to hold a British Air Pageant in Edinburgh in July, 1929. Arrangements for the event are as yet only in the preliminary stage.



# THE ROYAL AIR FORCE

London Gazette, November 13, 1928.

## General Duties Branch

The follg. Pilot Officers on probation are confirmed in rank :—L. W. Howard (Oct. 5); K. C. T. Marshall (Oct. 18); N. F. V. Henkel (Oct. 25). The follg. are transferred to the Reserve, Class A (Nov. 10). Flying Officers C. G. C. Sullivan, E. R. H. Coombes, J. H. Caulfield, T. A. Hale-Monro, P. Stainer.

Flying Officer V. A. C. Ross is transferred to Reserve, Class C (Nov. 10); Flying Officer A. S. Lewis relinquishes his short service commn. on transfer to the Indian Army (Nov. 9); Lieut.-Comdr. A. G. Elliot, R.N., Flight-Lieut., R.A.F., ceases to be attached to R.A.F. on return to Naval duty (Nov. 9).

## Stores Branch

Pilot Officer on probation M. M. McMullan is confirmed in rank and promoted to rank of Flying Officer (Oct. 15).

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified :—

### General Duties Branch

**Flight Lieutenants:** G. G. Walker, M.C., to No. 2 Armoured Car Coy., Middle East, 25.10.28. V. R. Gibbs, D.S.C., to R.A.F. Staff College, Andover, 22.10.28.

**Flying Officers:** H. A. S. Byrne, to No. 504 Sqdn., Hucknall, 18.11.28. V. G. A. Hatcher, to R.A.F. Base, Malta, 2.11.28. R. K. Coupland, to

## RESERVE OF AIR FORCE OFFICERS

### General Duties Branch

J. Paton is granted a commn. in Class B.E. as Pilot Officer on probation (Nov. 13); F. E. S. Groves is granted a commn. in the Special Reserve as Pilot Officer on Probation (Oct. 8); Pilot Officer F. H. Dight is promoted to rank of Flying Officer (Nov. 3); Pilot Officer D. G. Allison is promoted to rank of Flying Officer in Special Reserve (Oct. 23); Flight-Lieut. H. V. Stammers, D.F.C., is transferred from Class A to Class C (March 10). The follg. Flying Officers are transferred from Class B to Class C :—W. W. Sanders (Oct. 6); S. H. H. Swanton (Sept. 11); W. Allan (Oct. 7); H. C. Norman (Sept. 2); A. E. Ansell (Sept. 16).

Flying Officer S. W. Lummis relinquishes his commn. on completion of service (Nov. 11).

### Medical Branch

Flight-Lieut. J. W. Harper is transferred from Class Diii to Class Dii (Dec. 14, 1927); Flight-Lieut. D. Le Bas relinquishes his commn. on completion of service, and is permitted to retain his rank (April 1).

R.A.F. Depot, Uxbridge, 12.10.28. G. M. Beattie, to R.A.F. Depot, Middle East, 1.11.28. J. St. C. Arbuthnot, to No. 100 Sqdn., Bicester, 6.11.28.

**Pilot Officers:** K. C. T. Marshall, to No. 26 Sqdn., Catterick, 4.11.28. A. C. R. Mackenzie and E. C. Ridler, to R.A.F. Depot, Uxbridge, on appointment to Short-Service Comms. (on probation), 9.11.28.

### Medical Branch

Flying Officer G. T. O'Brien, to R.A.F. Depot, Uxbridge, 12.11.28.

## AIR MINISTRY NOTICE TO AIRMEN

### Reporting of Destination on Departure from Civil Aerodromes

It is hereby notified :—

The attention of pilots is directed to the necessity of notifying their destination to the aerodrome authorities before departure from a civil aerodrome having a ground control.

Several cases have occurred in connection with flights to and from the Continent where, owing to the fact that a pilot has failed to report his destination to the authorities at the aerodrome of departure, the "all clear" signal has been given for the route concerned before the aircraft has arrived at its destination. It is pointed out that in such circumstances an aircraft may be lost at sea without any possibility of assistance being rendered. (No. 75 of 1928.)

### Dual Controls in Passenger Carrying Aircraft: Safety Precautions

1. Pilots using aircraft fitted with dual controls for the purpose of carrying passengers other than pupils receiving instruction in flying are required to ensure that effective precautions are taken to prevent accidental interference with the controls by the passenger.

2. Suitable protection can be secured by ensuring before the flight that the control lever operated from the passenger's seat is removed, that a suitable cover is provided to prevent interference with the movement of the dual rudder bar, control link and cables and that the ignition and engine controls operated from the passenger's seat are adequately protected or disconnected. (No. 76 of 1928.)

## IN PARLIAMENT

### Civil Aviation Pilots

SIR S. HOARE, on November 13, in reply to Capt. Garro-Jones, said there were six light aeroplane clubs in operation during the period January to September, 1927, and 11 at the beginning and 13 at the end of the period January to September, 1928. The number of new licences issued to club members during the former period was 56, and during the latter period 171. The number of civil licences issued to persons other than those above during the same periods was 87 and 136 respectively. In all cases licences issued to serving Royal Air Force officers are excluded.

### Railway Companies and Freight and Passenger Air Services

CAPTAIN GARRO-JONES asked whether representations had been received from Imperial Airways, Ltd., or the Government nominees upon its board of directors, to the effect that the railway companies were refusing reasonable co-operation with them in the development of their through freight and passenger services; and whether, in view of the intention of the railway companies to inaugurate air services, the Secretary of State for Air intends by any official or unofficial intervention to attempt to improve the relations between these two branches of transport?

SIR S. HOARE: I have been aware that negotiations have been (and, I understand, still are) taking place between Imperial Airways and the railway companies, but I have not as yet received any official representations of the kind referred to by the hon. and gallant Member. The question is primarily one for arrangement between Imperial Airways and the railways, but I should be happy to render any assistance in my power, if and when it appears that such action is likely to serve a useful purpose.

### Low Flying

MR. DAY, on November 14, asked the Secretary of State for Air the number of complaints that have been received by his Department from residents in thickly-populated districts complaining of the low flying of aeroplanes, which are a danger to the public; and what action he has taken?

SIR S. HOARE: Complaints of the kind referred to are received from time to time, but the total number is not great. Each complaint is dealt with by a senior officer at the Air Ministry, carefully investigated and, if considered desirable, brought to my personal notice. Suitable action is taken wherever the circumstances appear to demand it and the pilot can be identified. For example, a Royal Air Force pilot may be dealt with disciplinary or even brought before a court-martial; and a civil pilot's licence may be suspended if he can give no reasonable explanation of his low flying and he is also liable to have proceedings taken against him by the police under the Air Navigation Order where by flying at a low altitude or in proximity to persons or dwellings he causes unnecessary danger to persons or property. The Air Ministry is fully alive to the importance of this question, and I am most desirous that the development of aviation in this country shall be attended by a minimum of inconvenience to the general public. I have accordingly had special warnings on the subject issued to both Service and civil pilots.

### Strength of R.A.F.

SIR S. HOARE, in reply to Mr. Beckett, said on November 1, 1912, when flying was in its infancy, four airships and some 56 other aircraft were on charge. On November 1, 1928, the strength of the Royal Air Force was approximately 780 first-line aircraft, and in addition two airships were under construction but not yet in commission.

### London-Prague Service

SIR S. HOARE, on November 15, in reply to Sir H. Brittain, said he hoped that the London-Prague service would be inaugurated in the Spring of next year but the final details had not yet been settled. It was proposed to operate a daily service (Sundays excepted) in each direction for about seven to eight months during each year.

## R.A.E.S. AND INST.A.E.E.

### Official Notice

ON December 17, 1903, 25 years ago, Mr. Orville Wright made the first flight in the history of the world in a power-driven heavier-than-air machine. On the same day two flights were made by Mr. Wilbur Wright. To quote their own words: "The first flight lasted only 12 seconds, a flight very modest compared with that of birds, but it was, nevertheless, the first in the history of the world in which a machine carrying a man had raised itself by its own power into the air in free flight, had sailed forward on a level course without reduction of speed, and had finally landed without being wrecked. The second and third flights were a little longer, and the fourth lasted 59 seconds, covering a distance of 852 ft. over the ground against a 20-mile wind."

The Science Museum at South Kensington has been entrusted with the care of the original Wright machine in which these historic first flights were made. The Council of the Royal Aeronautical Society desire not only to honour the names of Wilbur and Orville Wright, but to mark their appreciation of the trust shown by their honorary life member, Mr. Orville Wright, by holding a dinner on Monday, December 17, in the Science Museum. The tables for the dinner will be arranged around the Wright machine. Col. Sir Henry Lyons, Director of the Science Museum, has kindly given his permission for the function, and is aiding the Society in every possible way.

The chair will be taken by the president, Colonel the Master of Sempill, A.F.C., who will also present on this occasion the various prizes and awards made by the council during the past year. A short address on the early work of the Wright brothers will be given by Mr. Griffith Brewer, a member of council.

Members are specially asked to make early application for tickets, as there is no possibility of arranging for an overflow, and it is desirable to provide places for members before including members' friends. The names are required for the printed list and to facilitate seating arrangements. No tickets will be forwarded, or places reserved, unless a remittance is enclosed. Tickets £1 10s. each, inclusive of wines.

J. LAURENCE PRITCHARD, Secretary.

## PERSONALS

### Married

AUERLEY WILLIAM GRAHAM MARTIN, R.A.F., only son of Brig.-Gen. H. Martin, C.B., of Torquay, was married on November 14, in London, to MARY WALKER, of The Lake Vyrnwy Hotel, Oswestry, widow of Comdr. B. C. Walker, R.N.

### To be Married

The marriage arranged between ARTHUR W. B. McDONALD, R.A.F., elder son of Dr. W. M. McDonald, O.B.E., and Mrs. McDonald, of St. John's, Antigua, and MARY JULIA, eldest daughter of Dr. and Mrs. RONALD GRAY, of Whincroft, Hindhead, will take place at St. Luke's Church, Grayshott, Hindhead, on December 15.

The engagement is announced between JOHN H. THOMPSON, late King's African Rifles and R.A.F., and Lady Hulton, widow of Sir Edward Hulton.

The engagement is announced between HENRY RICHARD DANVERS WAGHORN, R.A.F., elder son of the late Mr. John Danvers Waghorn and of Mrs. J. D. Waghorn, Aston Clinton, Buckinghamshire, and MARY HELEN DYMOCK (DOLLIE), only daughter of the late Mr. ROBERT WATSON and of Mrs. Robert Watson, The Bourne Ridge, Farnham, Surrey.

# MAPS FOR AIRMEN

"ALL-WEATHER MAPS, LIMITED" manufacture, under a patented process, the "Raynol" map which is proof against rain and oil, and is stain-proof; also it can only be marked by special pencils, which marks are easily rubbed off.

The maps, which are an advance on the original ones mounted on aluminium, are pliable and can be bent into any form without cracking, besides always retaining their original flat shape.

They have been tested by the Air Ministry, who have now placed a contract for a very large number, and by Imperial Airways, Limited, who have standardised them for their pilots over their routes in Europe and the East.

Twenty-four of the competitors in this year's King's Cup Race used the "Raynol" special race map, and most of the well-known aircraft firms and many of the most famous pilots have been supplied.

Special sets for long distance flights have been supplied, with satisfaction and at a very moderate price.

The process has also been adapted to road maps, which are now on sale at all W. H. Smith & Sons' shops.

For the use of pilots in England and Wales, a special "Raynol" map, made up into sections, and incorporating the Ordnance Survey layered editions, 4 miles to an inch, is made. The map comprises 87 sections with key map and is fitted up with special covers and a container to carry sections not in use. The country has been divided into areas, each area taking in a radius of about 100 miles. Full details can be obtained from the chief instructors of the various aero clubs, who have been furnished with a map and who will explain it and quote prices. This information can also be obtained direct from All-Weather Maps, Limited, of Lincoln House, High Holborn, London, W.C.

An addition to this company's activities is the publication of a passenger flying map for Imperial Airways, Limited. It takes in the routes London-Cologne, London-Paris-Zurich. The first issue is one of 30,000. The map is made up into 12 sections and ringed into covers very attractively. The price is 1s.

Mr. S. B. Berry, Managing Director of the firm, who has worked this business up to its present position, has recently had the honour of making up special sets of "Raynol" maps for the Under-Secretary of State for Air, Sir Philip Sassoon, for his flight from England to Cairo, Khartoum, Basrah, Karachi and back. The sets are in four separate books, magnificently finished off and marked by simplicity.

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# A Bristol Instructional Film

ON November 8 Mr. J. L. Owner of the Bristol Aeroplane Co., Ltd. gave a private view of a film which is shortly to be exhibited to the public at the Imperial Institute. This film, prepared for exhibition at R.A.F. stations and training establishments, etc., has proved so popular, and so many requests have been received for the loan of it, that it has now been decided to arrange for it to be made available to a wider circle.

The film illustrates in a most clear and interesting way the production, erection, use and dismantling of the famous Bristol "Jupiter" engine, from the casting of components in the Bristol Company's own foundries to flights in a number of different aircraft of British and foreign nationality.

Of the section of the film taken in the works, those were, perhaps, the most convincing which showed the ease with which components, or even large assemblies, were pushed home on the engine during the erecting process. Nothing but the most perfect fitting could have resulted in such ease of assembling, and Mr. Owner pointed out that it was made an invariable rule in the shops that no erector was to do any fitting under any circumstances whatever. In the very few instances where imperfect fitting was encountered, the offending part was returned to stores, thence to be inspected again and the fault located.

The very rigorous system of inspection in force at the works at Filton was well illustrated, and those who had not had the privilege of actually spending many hours in the works obtained from the film a very good idea of the conditions under which the "Jupiter" is produced. What, however, the film failed to show, or at least failed to do full justice to, was the superb workmanship put into the "Jupiter" engines. Only an examination of the actual engine parts can reveal this.

A portion of the film showed the sectional engine in the South Kensington Museum running slowly, and from it it was possible to obtain a very good idea of the working of the "Jupiter." The eccentric epicyclic cam gear, however, almost defeated observation, the movement being so appa-

rently complicated that it was difficult for one not already familiar with the mechanism to follow the working of the gear. The casting of aluminium cylinder heads, the gang machining of the fins on the steel cylinder barrels, and the machining all over of the split crankcase were manufacturing processes which proved of surpassing interest.

Of very practical value were the sections of the film dealing with assembling and dismantling, and the use of the—relatively few—special tools supplied with every engine. These sections not only illustrated the amount of thought given to the details of the design, but also brought out very clearly how comparatively simple, from a maintenance point of view, is the nine-cylinder radial with its comparatively few parts.

Altogether the film is one of the most interesting and instructive which we have seen, and when it is shown in public all who can possibly do so should, for their own sake, make a point of seeing it. It is an education in British efficiency.

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# PUBLICATIONS RECEIVED

*Aeronautical Research Committee Reports and Memoranda: No. 1144 (Ae. 312).—Report on the Development of a Hot-Wire Rate of Descent Meter. By G. W. H. Gardner and F. W. Meredith. August, 1927. Price 1s. net. No. 1157 (Ae. 322).—On the Horizontal Flight of a Helicopter. By H. Glauert. March, 1928. Price 9d. net. H.M. Stationery Office, Kingsway, London, W.C.2.*

*The Story of a North Sea Air Station. By C. F. Snowden Gamble. Humphrey Milford, Oxford University Press, Amen House, Warwick Square, London, E.C. Price 21s. net.*

*Bauvorschriften für Flugzeuge, August, 1928. Deutschen Versuchsanstalt für Luftfahrt, E.V., Berlin-Adlershof. Price, Rm. 5.*

*Die Elektrische Ausrüstung des Kraftfahrzeuges. Teil I: Zündung. By E. Klaiber and Dr. W. Lippart. M. Krayn, Genthiner Strasse 39, Berlin, W.10. Price, Mk. 17 and 19.*

*The Royal Air Force Cadet College Magazine. Vol. VIII, No. 2. Autumn, 1928. Gale and Polden, Ltd., Wellington Works, Aldershot.*

*Aeronautical Research Committee Reports and Memoranda: No. 1160 (Ae. 325).—The Resistance of the International Airship Models Measured in the Wind Tunnel of the Royal College of Science, South Kensington, S.W.7. By Prof. F. T. Hill and T. Tanner. March, 1928. Price 9d. net. No. 1161 (M. 56).—Report on the Drop of Stress at Yield, in Armco Iron. By A. Robertson and A. J. Newport. November, 1927. Price 9d. net. H.M. Stationery Office, Kingsway, London, W.C.1.*

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# AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

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